April • 1957

MPM

Metal Products Manufacturing

including finish

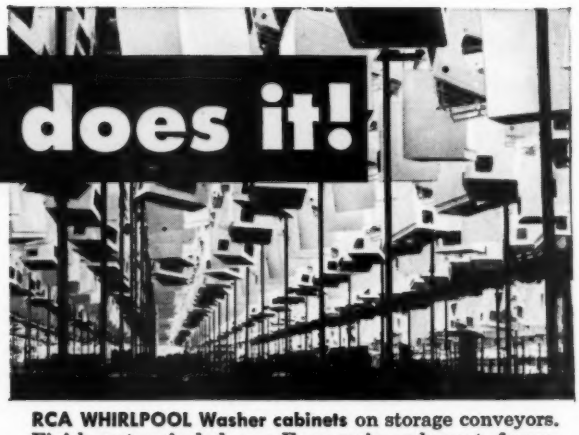
SERVING THE *Appliance* AND FABRICATED METAL PRODUCTS INDUSTRY

FROM RAW METAL TO FINISHED PRODUCT

EPON® RESIN does it!

Tough primer on RCA WHIRLPOOL Washers

withstands rugged washday punishment



RCA WHIRLPOOL Washer cabinets on storage conveyors. Finish system includes an Epon resin undercoat, formulated by Grand Rapids Varnish Corporation.

Epon resin-based finish plus careful inspection eliminate customer complaints.

HERE'S HOW...

SOAPS AND MODERN high-strength detergents are persistent enemies of ordinary paint. Because of severe corrosive conditions in some geographical areas, home laundry appliances often show rust stains in just a few weeks of service.

Whirlpool-Seeger Corporation, St. Joseph, Michigan, has found that a primer based on Epon resin gives an outstandingly superior protective finish to its washers, driers, and other home laundry equipment. To maintain the highest standards for coatings, Whirlpool-Seeger set up a system of continuous quality-control testing in their finishing section.

Epon resin-based primers, now standard on RCA WHIRLPOOL Washers, are credited with all but eliminating a major source of field complaints about coating failures.

• • •

If you have a product finishing or paint maintenance problem, you, too, may find that Epon resin-based coatings will do the job better. They have excellent adhesion, high resistance to impact and abrasion, outstanding resistance to moisture, heat, and corrosives. Ask your supplier for Epon resin-based paints and enamels. Write for the full Epon resin coatings story: "*Planning to Paint a Pyramid?*"

SHELL

SHELL CHEMICAL CORPORATION

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Epon resins are the epoxy polymers made exclusively by Shell Chemical Corp.

Every surface is a work surface when it's Porcelain Enameled

Every porcelain enameled surface in the kitchen . . . drain boards, range tops, dishwasher tops, cabinet tops, and many others . . . provides a work area. That's one important reason why busy housewives prefer appliances with this beautiful lifetime finish.

Porcelain enameled finishes make good work surfaces because this dense, glass-like material resists food acids, scratching, heat, and thermal shock. Ordinary soap or household cleaners keep porcelain enamel clean, sanitary, and free of stains.

What's more, porcelain enamel won't fade, stays color-fast. An infinite variety of colors and shades is now available.

QUALITY BASE METAL

For more than 40 years, porcelain enamelers have been specifying Armco Enameling Iron for the base metal because of its uniform flatness and bonding characteristics. During that time it has become known as the "World's Standard Enameling Iron."

If you would like to consider giving *your* products all the sales advantages that go with a porcelain enamel finish, let us send you our catalog, "*Armco* Enameling Iron." This informative booklet contains helpful tips on fabricating, welding, cleaning, pickling, and porcelain enameling. Just fill in and mail the attached coupon for a free copy.

ARMCO STEEL CORPORATION
2346 Curtis Street, Middletown, Ohio
Send us your catalog, "Armco Enameling Iron"
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Company_____
Street_____
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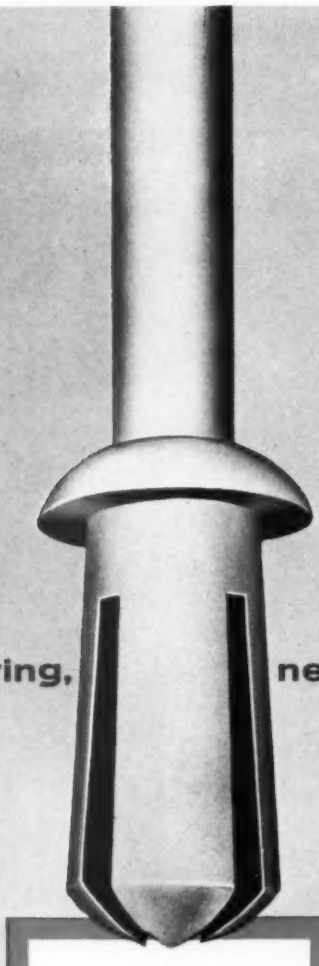
ARMCO STEEL CORPORATION
2346 CURTIS STREET, MIDDLETOWN, OHIO
Sheffield Steel Division • Armco Drainage & Metal Products, Inc. • The Armco International Corporation

time-saving, neat-appearing **FASTEX®**

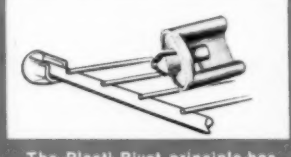
Plasti-Rivets®



JUST SET . . .

. . . AND DRIVE

Plasti-Rivets fasten molding onto coin-operated machines, are available in colors to complement product color scheme.



The Plasti-Rivet principle has been incorporated in Plasti-Supports (TM); form ideal refrigerator shelf-supports.

Molded of thermoplastics, Plasti-Rivets fasten from one side with a single blow. The prongs expand when the integrally molded pin is driven, providing a positive, vibration resistant lock. Blind assembly is simplified, products improved and time saved while costs are reduced. Plasti-Rivets can withstand a direct shear of up to 500 pounds. Available in a choice of decorator colors and shapes, Plasti-Rivets will never mar or scratch your product's surface. For a firm, positive fastening, specify easy-to-use Fastex Plasti-Rivets.

Write for your free sample packet and informative brochure listing 25 standard Plasti-Rivets. See how simple and economical blind fastening can be.

Fastex Plasti-Rivets Create Assembly Savings In: non-conductive fastening of electrical products, name plate attachments, appliance shelf fastening, rustproof fiberglass awning fastening, and color-matched fastenings for practically any product.

FASTEX / **DIVISION OF ILLINOIS TOOL WORKS**
195 Algonquin Road • Des Plaines, Illinois

In Canada:
SHAKEPROOF-FASTEX
Division of Canada
Illinois Tools, Ltd.
Toronto, Ontario

itw

April • 1957

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FEATURES

	Page
SPECIAL MACHINES AND FIXTURES AID RAPID WELDING OF DRYER CABINETS. Describing welding operations at Whirlpool-Seeger Corp., Marion, Ohio	26
PUTTING THE ACCENT ON DEALER SUPPORT. by H. P. Mueller, Jr., Vice President-Sales, Mueller Climatrol	29
EFFECT OF CERAMIC COATINGS ON CREEP OF ALLOYS. by J. R. Cuthill, J. C. Richmond & N. J. Tighe, Enameled Metals Laboratory, National Bureau of Standards	34
PROPERTIES OF LOW TEMPERATURE PORCELAIN ENAMELS. by H. P. Tripp, General Electric Co.	37
ANNUAL STATISTICAL REVIEW	41
THE ORGANIC FINISHING SYSTEM AT CURTIS LIGHTING. by E. W. Harris, Works Manager, Curtis Lighting, Inc.	46
PLASTISOL COATINGS PROTECT PLANT EQUIPMENT. by Gilbert C. Close, Western Editor, MPM	50
PRESSED METAL INSTITUTE TECHNICAL MEETING. by Dana Chase, Editor	52
13th INTERNATIONAL HEATING AND AIR-CONDITIONING EXPOSITION BIG SUCCESS	63
HOW TO SOLDER STAINLESS STEEL. by G. W. Hinkle, Stainless Metallurgical Engineer, Republic Steel Corp.	64
AHLMA TO STIMULATE INDUSTRY THINKING FOR THE FUTURE. by B. J. Hank, President, American Home Laundry Manufacturers' Association	66
THE ELECTROPLATING OF ZINC DIE CASTINGS. by Ernest Horvick, American Zinc Institute, Inc.	68
CERTIFIED SAFE TRANSIT LABORATORIES BACK NST TESTING PROGRAM. by Paul T. Glaman, Assistant Secretary, NST Committee	ST-3
SAFE TRANSIT NEWS	ST-8

DEPARTMENTS

EDITOR'S MAIL	10
MPM FOTO NEWS	18
INDUSTRY MEETINGS CALENDAR	24
MPM SPOTLIGHT	72
SUGGESTION BOX	74
INDUSTRIAL LITERATURE	76
NEW PRODUCTS	78
INDUSTRY NEWS	83
INDUSTRY PERSONALS	88
SUPPLIER NEWS	95
SUPPLIER PERSONALS	100
ADVERTISERS' INDEX	112
CLASSIFIED ADVERTISING	112

METAL PRODUCTS MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is $8.00 per year, domestic. To all other countries $10.00 per year (U.S. funds). Single copies, $1.00.

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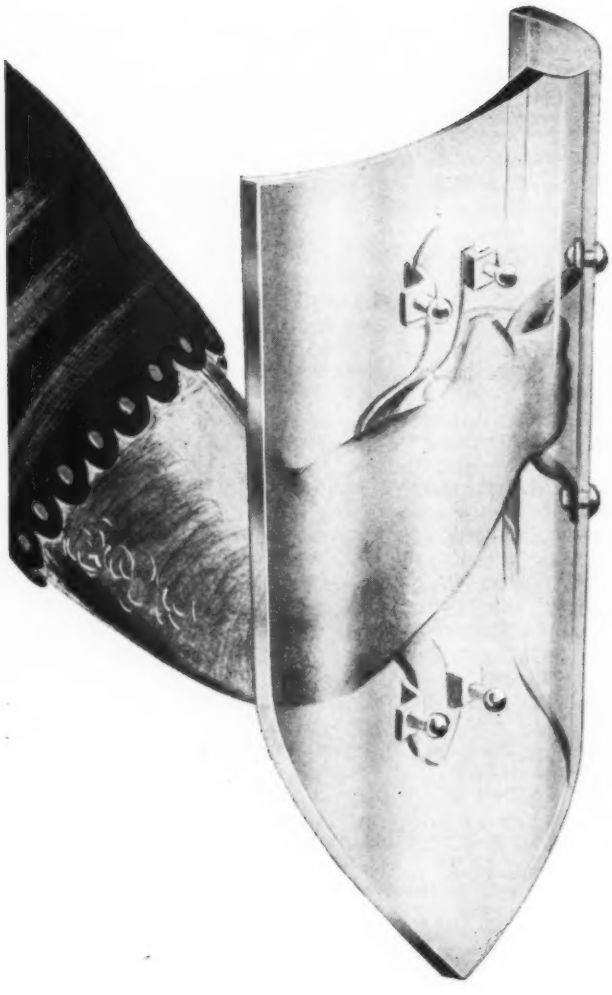

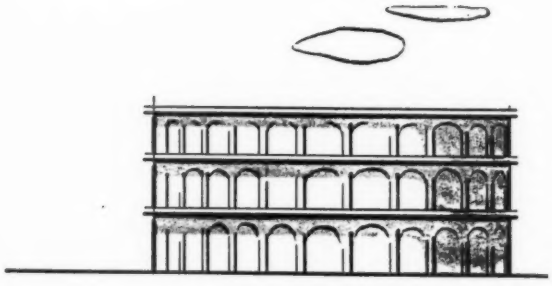

this *Glass* shield,

while symbolic,

represents some of the things a master craftsman can do with glass. It can be bowed to fit any desired shape, it can be drilled and shaped to exact tolerances.

It can be tempered to impart extreme resistance to impact — that is why safety regulations demand glass as a safety barrier when danger exists.

Let glass improve the utility of your product while it beautifies it.

Let Marsco's craftsmen-engineering team impart to your product all the advantages of glass

Here are some of the applications for Marsco heat-treated, tempered and hardened glass parts:

- CLOCK & TIMER CRYSTALS
- OVEN DOORS
- RADAR EQUIPMENT
- AIRCRAFT ACCESSORIES
- PHOTOGRAPHIC EQUIPMENT
- LIGHT LENSES
- DIALS & NAME PLATES
- TELEVISION EQUIPMENT
- INSTRUMENTS
- MEDICAL EQUIPMENT

Special shapes for: Instruments, Gauges, Household and Industrial Appliances.

Marsco

MARSCO MFG. CO., 2909 S. HALSTED ST., CHICAGO 8, ILL.

room air conditioning unit using H&K perforated metals

In the ¾ ton window air conditioner illustrated, perforated metals have been combined successfully with injection moulded plastics. The utilization, here, of new louvered perforated metals in adjustable frames on the frounced surface in combination with new embossed patterns on sides and under surfaces, afford rich tactile qualities hitherto unattainable in the air conditioner field.

Harrington & King perforated metals provide the Industrial Designer and other men of ideas unlimited opportunities to offer both functional and aesthetic properties as demanded in products for today's market.

H & K engineers will be pleased to work with you on your perforated metals requirements.

Fill in and mail coupon to nearest H & K office

* Product Development by William M. Schmidt Associates

The design, pattern and open area for almost every application may be selected from our thousands of perforating dies . . . at no charge for tooling. (If a special design is required, tools will be built to order.)

Harrington & King can perforate practically any material that can be obtained in coils, sheets or plates . . . from foil-thin to 1" thick. Metallic materials —steel, aluminum, stainless steel, brass, copper, monel, zinc, bronze, etc. Non-metallic materials— plastics, wood composition, paper, cloth, etc.

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New York, N.Y.

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☐ STOCK LIST of Perforated Steel Sheets

NAME _____
TITLE _____
COMPANY _____
STREET _____
CITY _____ ZONE _____ STATE _____

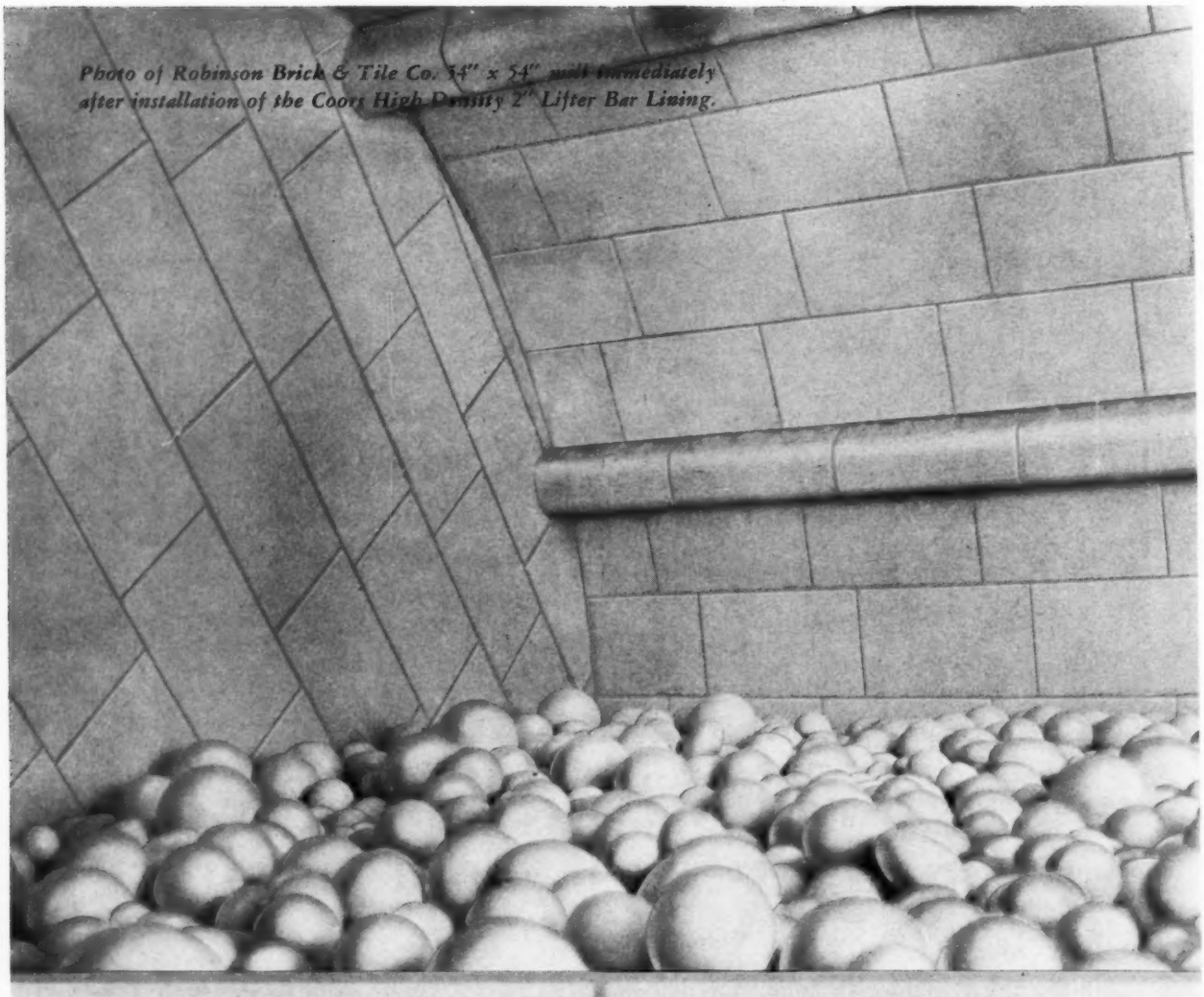


Photo of Robinson Brick & Tile Co. 54" x 54" mill immediately after installation of the Coors High Density 2" Lifter Bar Lining.

"We started using Coors High Density Grinding Balls in 1950, for grinding raw glazes. For the past four years we have used Coors Grinding Balls in all of our mills, and their service life has been outstanding. We have cut our milling time some 25% while obtaining our required grind for ceramic glaze — 0.35% average on a 325 mesh screen.

"In July, 1954, we lined our 42" x 38" mill with a Coors 1½" plain lining. In October, 1956, our 54" x 54" mill was lined with a Coors 2" Lifter Bar Lining; and in December, 1956, a 24" x 36" mill was lined with Coors 1½" Lifter Bar Lining.

"We have found that the lifter bar linings enable us to increase the batch charge and at the same time cut grinding time another 5%," Gay Kalb, Glaze and Materials Foreman, Robinson Brick & Tile Co.

For technical information please write:

LZP INDUSTRIAL CERAMICS CO.

275 Kalamath St., Denver 23, Colo.

National Sales Representatives for

COORS PORCELAIN COMPANY

Manufacturers of High Density Grinding Balls and Mill Liner Brick

"we obtained the fine grind
we wanted on raw glazes
and **cut**
production time
30%, too,
using *Coors*
Grinding Balls and Mill Liner Brick"

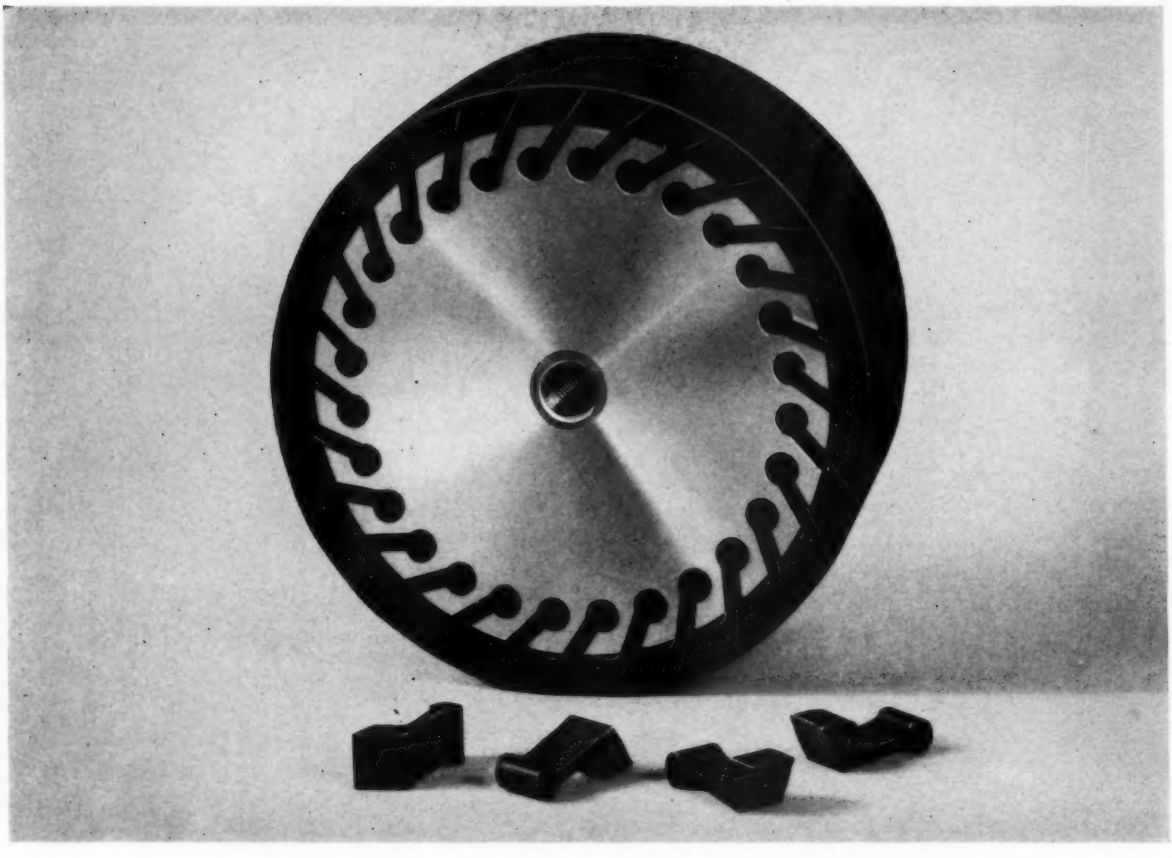
ROBINSON BRICK & TILE COMPANY

Gay Kalb, Glaze and Materials Foreman, Robinson Brick & Tile Co., inspects the 54" x 54" mill lined with Coors High Density Lifter Bar Lining.

LZP INDUSTRIAL CERAMICS CO.
275 Kalamath St.
Denver 23, Colorado

Please send technical information and samples of Coors Grinding Media.

Name.....
Title.....
Company.....
Address.....
City and State.....



New FLEXCORE grinding wheel with interchangeable rubber segments reduces operating costs and gives greater application flexibility

Twenty-eight separate, replaceable rubber segments (flexers) grip the coated abrasive and form the grinding surface of the new Flexcore grinding wheel. This interchangeable feature provides the following advantages:

LOW OPERATING COST. As flexers become worn or damaged they can be replaced singly or in groups. The core never needs to be replaced . . . the original investment is never lost. The cost for a complete set of replacement flexers for an average Flexcore wheel is only $4.50.

VARIABLE CUTTING ACTION. Flexers are available in a variety of hardnesses and so can be used in any combination to attain different cutting actions. For example, a fast cutting action is achieved by using hard segments and soft segments in alternate slots.

POSITIVE GRIP ON ABRASIVE BAND. The Flexcore is so designed that the flexers make complete peripherial contact with the coated abrasive band. This provides greater holding power so that the wheel can be operated at much slower speeds than is possible with conventional expanding-type wheels.

Flexcore wheels are manufactured under rigid quality control standards. Slots are uniform in size and number. Flexers are identical. The core is balanced at the factory and stays balanced in use.

SEND TODAY for complete specifications, wheel sizes and prices.

N-116

NU-MATIC GRINDERS, INC. 8224 Carnegie Avenue Cleveland 3, Ohio

On modern refrigerators...

DULUX® meets the exacting requirements of today's topflight manufacturers

DU PONT
REG. U.S. PAT. OFF.

"DULUX" ENAMEL

Better Things for Better Living . . . *through Chemistry*

America's leading home-appliance finish

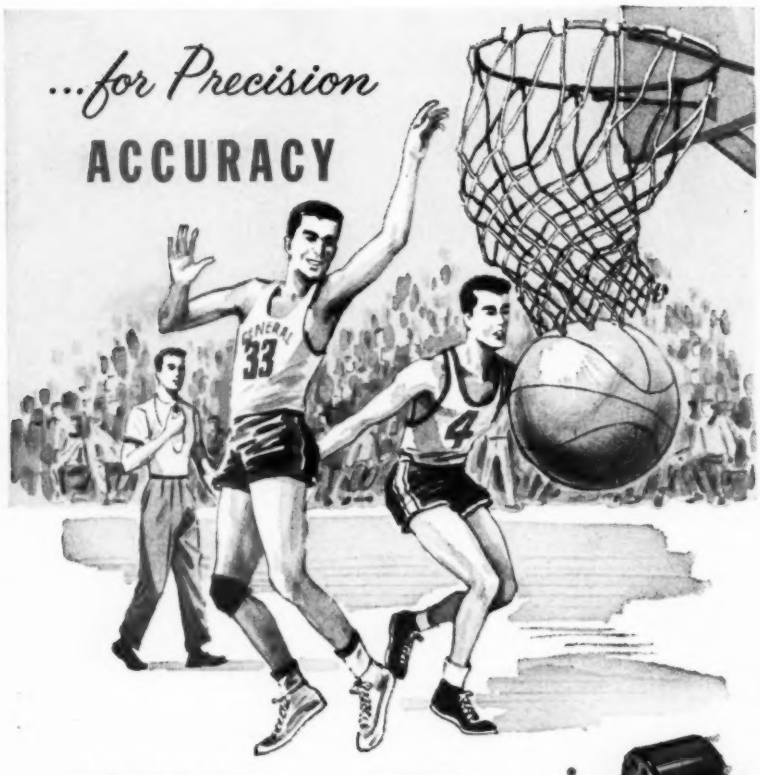
Over 53,000,000 major home-appliance units now in service are finished with Du Pont DULUX Enamel.

LEADING APPLIANCE MANUFACTURERS know that durable Du Pont DULUX is a finish of *consistent* quality. Every shipment of this fine finish meets the *same* rigid specifications. And that's just one of the important cost-cutting, sales-winning advantages that DULUX offers.

Constant research by Du Pont chemists has resulted in a finish that gives more rugged resistance to chipping, cracking, scratching and staining. Application costs are lower, too—without sacrifice of quality appearance and dependable performance.

DULUX keeps its flawless appearance after years of constant use in the home. Its easy cleanability, resistance to wear and long-lasting whiteness help build the continued customer satisfaction so vital to the success of any appliance line. *No wonder so many of today's topflight appliance manufacturers use Du Pont DULUX Finishes.*

E. I. du Pont de Nemours & Co. (Inc.), Finishes Div., Wilmington 98, Del.



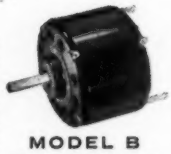
RELY on GI

Fractional H. P. Motors

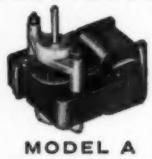
1/40 H. P. to 1/1100 H. P.

The precision accuracy built into every GI fractional h.p. motor is just one of the reasons why so many leading original equipment manufacturers "specify GI"! For motors that "hit the specs" every time, for ruggedness and economy, GI 1/40 H.P. to 1/1100 H.P. motors are unexcelled in the industry. Manufacturers appreciate the *extra value* of General Industries' free design consultation service and prompt deliveries, too. When you have a fractional h.p. requirement, you can always . . . RELY on GI!

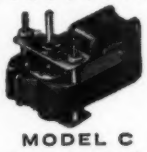
Write for complete specifications and quantity-price quotations today!



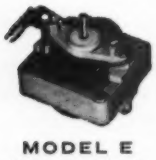
MODEL B
4-pole, 4-coil shaded pole AC Induction Type



MODEL A
2-pole, shaded pole AC Induction Type



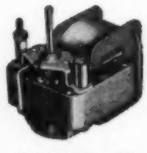
MODEL C
2-pole, shaded pole AC Induction Type



MODEL E
4-pole, shaded pole AC Induction Type

MODEL D
4-pole, 4-coil shaded pole AC Induction Type

MODEL O
2-pole Capacitor Reversible Type AC only (for 6, 12, or 24 volts)



MODEL F
2-pole, shaded pole AC Induction Type

THE GENERAL INDUSTRIES CO.

DEPT GF • ELYRIA, OHIO

formability of metals

Gentlemen: We would appreciate receiving a reprint of the article "Formability of Metals, III, Press Operations", by Lester F. Spencer, which appeared in the December, 1956 issue of *Finish* (now MPM).

R. L. Werner
Ass't Chief Engineer
R. D. Werner Co., Inc.
Greenville, Pennsylvania

Ed Note: Reprint mailed immediately. We hope you find it useful.

reprint on Mueller Climatrol

Sir: I would very much appreciate a reprint of the report on Mueller Climatrol operations as it appeared in your February issue under the title "They make the weather behave."

Andrew T. Boggs III
Technical Secretary
The American Society of Refrigerating Engineers
New York City

Ed NOTE: It's on the way with our compliments and a "thank you" for the interest.

Another subscriber

Gentlemen: I am writing to request that my name be placed on your circulation list for *finish* magazine.

D. Lizar
Project Supervisor, Electric Ranges
Philco Corp. of Canada, Ltd.
Don Mills, Ontario, Canada

Ed. Note: We are pleased to learn of your interest, and will be happy to comply with your request. We should like to take this opportunity to point out that, effective with the February, 1957 issue, the title of our publication has been changed from *finish* to METAL PRODUCTS MANUFACTURING.

Shows interest in MPM

Gentlemen: Kindly send us a specimen copy of your publication and your subscription rate. Please address your reply to the attention of the undersigned.

A. A. Radel, Vice President
Globe Metal Products Co.
Baltimore 13, Md.

Ed. Note: The enclosed 4-page folder will explain that we have just recently changed the title of our publication to METAL PRODUCTS MANUFACTURING, effective with the February, 1957 issue (February issue is in the mail). Our publication is distributed on a free controlled circulation basis to eligible recipients. Inasmuch as you qualify under our circulation policy, your name will be added to our circulation list commencing with the March issue.

electrostatic spray equipment

Dear Mr. Chase: I notice on page M-10 of the February 1957 issue of METAL PRODUCTS MANUFACTURING that you have an article entitled "Mueller

to Page 14 →

bright idea

For enduring beauty that sells in a new car and
re-sells in a used car . . . design it, improve it and protect it
with McLOUTH STAINLESS STEEL.

specify

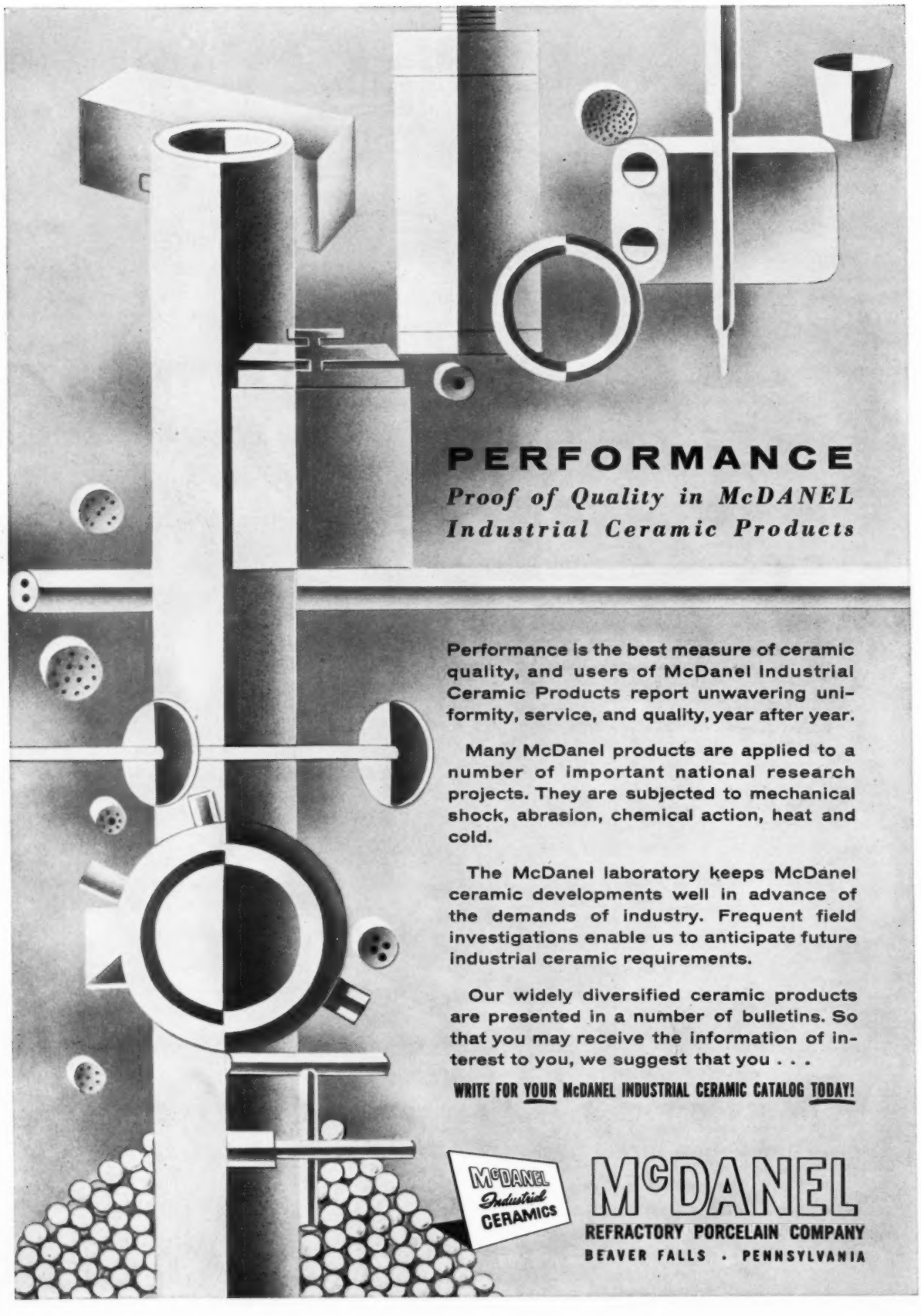
McLOUTH STAINLESS STEEL

HIGH QUALITY SHEET AND STRIP

for automobiles

McLOUTH STEEL CORPORATION DETROIT, MICHIGAN

MANUFACTURERS OF STAINLESS AND CARBON STEELS


PERFORMANCE
Proof of Quality in McDANEL
Industrial Ceramic Products
Performance is the best measure of ceramic quality, and users of McDanel Industrial Ceramic Products report unwavering uniformity, service, and quality, year after year.
Many McDanel products are applied to a number of important national research projects. They are subjected to mechanical shock, abrasion, chemical action, heat and cold.
The McDanel laboratory keeps McDanel ceramic developments well in advance of the demands of industry. Frequent field investigations enable us to anticipate future industrial ceramic requirements.
Our widely diversified ceramic products are presented in a number of bulletins. So that you may receive the information of interest to you, we suggest that you . . .
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McDANEL Industrial CERAMICS
McDANEL
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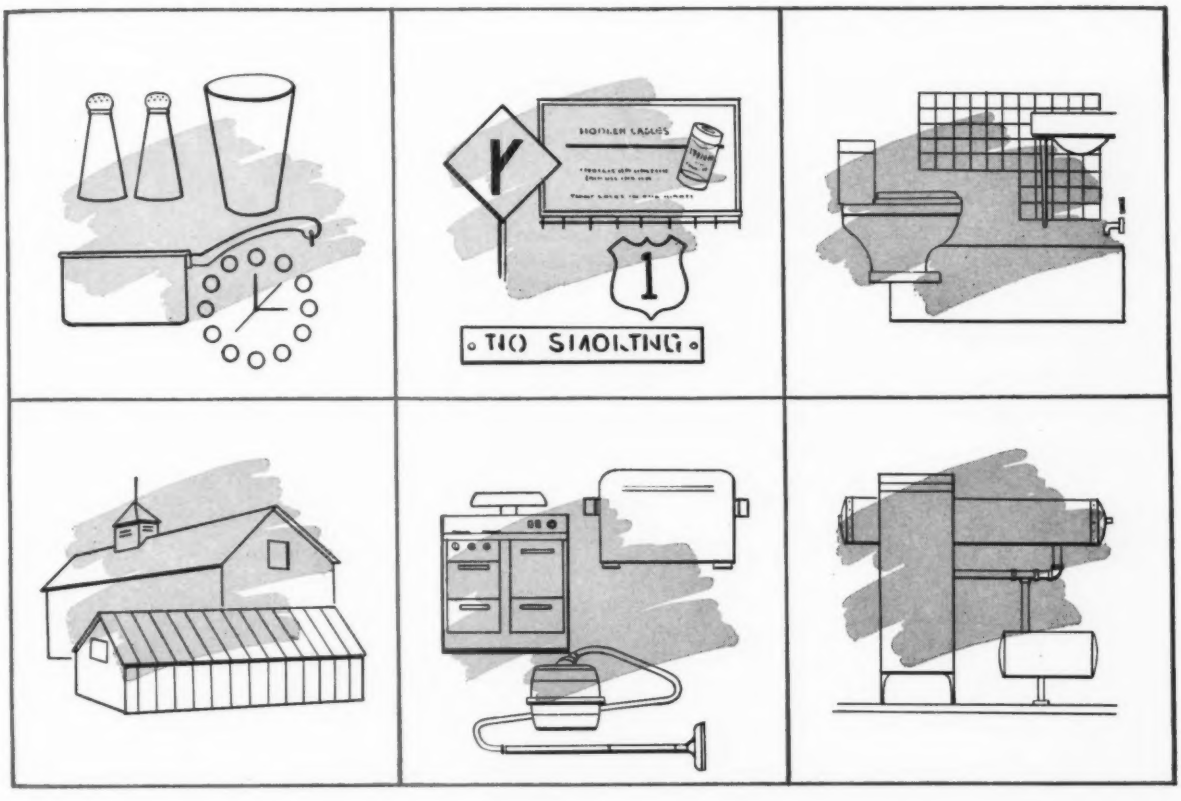
BEAVER FALLS · PENNSYLVANIA



Du Pont Porcelain Enamels for Aluminum Create New Enameling Business for You

If you enamel your own products or supply other manufacturers with finished materials, Du Pont porcelain enamels for aluminum can help you increase the sales of your product or services.

Any aluminum product offers a potential use for these colorful finishes . . . every shape and application. Appliances, furniture, fixtures, signs, tile, utensils, roofing, sheet siding and store fronts are a few of the many applications of finished aluminum.

Du Pont enamels, in an unlimited range of colors, are easily applied with conventional equipment. An excellent finish-to-metal bond gives you a virtually indestructible surface.

Aluminum enameling offers new profitable volume to the fabricator who now supplies unfinished aluminum . . . to the enameler who wishes to add aluminum to the materials he now finishes or to convert his entire operation to aluminum finishing.

• • •

TECHNICAL ASSISTANCE. Du Pont manufactures porcelain enamels . . . but does no enameling. As a pioneer developer in these finishes, we can offer you much useful information. Or, if you desire, we can put you in touch with enamelers who can take care of your needs.

DU PONT
PORCELAIN ENAMEL
FOR ALUMINUM

DU PONT
REG. U. S. PAT. OFF.

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E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department, Wilmington 98, Delaware

☐ Please send me Technical Bulletin CP 4-454 and illustrated folder on Porcelain Enamel for Aluminum.
☐ Have your technical representative call with further details.

NAME_____ POSITION_____
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new glamour in the kitchen

with NICKELOID METALS

Pre-Plated Metals Offer Design Freedom, Production Savings!

Beautiful, easy-to-clean built-in range by Oakland Foundry, Belleville, Ill., features Nickeloid pre-plated chrome steel, satin finish, for door panels, oven, burner inserts, control panel and hood.

More Than A Metal—It's A Method

Oakland Foundry, Belleville, Ill., a leading manufacturer of electric ranges, puts it this way: "We were unable to fabricate the alternate material without new tooling. Nickeloid Metals have increased our production, reduced rejects and lowered the costs of our product".

If *you* are caught between increasing manufacturing costs and the constant consumer demands for new and improved products, consider Nickeloid *Pre-Finished* Metals. An extremely versatile design material, they fit right in with standard production techniques, without major retooling — lower manufacturing costs and equipment investment because they require no cleaning, post-plating, polishing. You just fabricate and assemble — *and save!*

Choose from beautiful, durable finishes of chrome, nickel, copper or brass on steel, zinc, copper, brass and aluminum. Sheets, strips, coils.

NICKELOID METALS SINCE 1898

SEE NICKELOID — BOOTH 1307

Design Engineering Show
New York Coliseum — May 20-23

AMERICAN NICKELOID CO.
PERU 11, ILLINOIS

Editor's mail → *from Page 10*

Climatrol's new paint set-up is lesson in preplanning." I would appreciate receiving the name of the firm which made the electrostatic spray paint set-up as shown on page M-11 of this issue. Thanking you for this information, I am

L. L. Carrick, Professor
Chemical Engineering
University of Michigan
Ann Arbor, Michigan

Ed Note: The electrostatic spray equipment manufacturer is Ransburg Electro-Coating Corp., Indianapolis, Indiana. Glad to note your interest in the organic finishing section of the Mueller feature.

specs for white appliance finishes

Gentlemen: We have circulated the article among several members of our organization and it is the consensus of opinion that it is one of the best articles they have read on the selection of a finish type for a particular household appliance application and the practical specifications for such. The paragraph on the critical problems of testing gives information on the preparation of test panels which is too often neglected and the cause of erratic and incorrect results on testing. The table on the cost and coating properties of eighteen different formulations of coatings is interesting and conforms with our findings. We would like to see more articles of this nature in your fine magazine.

P. H. Wiegand
Technical Department
Pittsburgh Plate Glass Company

Ed Note: The response to the article "Specifications for white appliance finishes" by Edward G. Bobalek of Case Institute of Technology, has been excellent. The keen interest in the subject is indicated. More information will appear in MPM as important data becomes available.

information, purchase guide

Gentlemen: You have been kind enough to include me as a subscriber to your publication, "Finish" during thte past several years. I have enjoyed the various articles and have gained much valuable information, in addition to keeping abreast of new developments and as a purchasing guide, etc. I have recently changed my position but my activities still entail engineering and purchasing in connection with kitchen cabinets and allied appliances. A transfer of my subscription to my new address would be very much appreciated.

E. J. Perrott, General Manager
Johnson Metal Craft Corporation
720 South Montford Ave.
Baltimore 24, Maryland

Ed Note: Our interested reader, Mr. Perrott, was formerly Chief Engineer at Miller Metal Products, Inc., Baltimore.

vibrating table interesting

Gentlemen: After reading the article on the vibrating table to separate stampings from the slugs at the R. Krasberg & Son Mfg. Company, I am very much

to Page 71 →

REPORT NO. 5 / ON LOWERING TODAY'S COST OF PRODUCTION

Combined cleaning-phosphatizing speeds production, lowers costs

One pound of Divobond per 1,000 square feet of work

Where equipment, stock and operating conditions permit, the entire organic finishing pre-treatment cycle can be speeded up without any sacrifice in product quality. As work passes through a Diversey Divobond phosphatizing spray, soil is rapidly penetrated, flushed away, and a tightly adherent iron phosphate coating covers the metal. Surfaces are left with the uniform, iridescent appearance of a quality phosphate treatment.

Divobond's unusually high cleaning action (for a phosphatizing compound), makes one operation cleaning-phosphatizing a reality in many plants where the two operations had been divided. The result is faster production and lower compound requirements.

Divobond is so effective, only one pound is required to *clean and phosphatize* 1,000 square feet of work. Since Divobond coatings are tightly adherent, should the finish be broken, the phosphate coating will not fracture to expose the base metal. This safeguard against rust is an important reason why Divobond is favored for manufacturing many consumer items.

Divobond in five stage washers

Where a spray wash is required prior to phosphatizing, Divobond is the fourth stage following the wash and two rinses. The wash compound, incidentally, should be fast acting to keep pace with Divobond which generally requires short cycles.

Diversey No. 519 was specially developed to meet that need for fast, thorough soil removal. It supplements the mechanical action of water jets with high powered cleaning action . . . completely removes inks, oils, drawing and buffing compounds and other soils from aluminum and die-cast work, pressed and formed steel.

For illustrated literature on Divobond and No. 519, write to The Diversey Corporation, 1820 Roscoe Street, Chicago 13, Illinois.

PLANTS IN CHICAGO, NEWARK AND SOUTH GATE, CALIFORNIA. WAREHOUSES IN PRINCIPAL CITIES.

DIVERSEY. **DIVOBOND**

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GIBSON REFRIGERATOR COMPANY
GREENVILLE, MICHIGAN

THE Sunray STOVE CO.

EERLESS PRODUCTS CO.

ATHENS STOVE WORKS, INC.
ATHENS, TENNESSEE

THE Enterprise FOUNDRY COMPANY LIMITED

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DM DETROIT-MICHIGAN STOVE COMPANY

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Preway Inc.

Premier

Admiral

Enterprise

MOFFATS LIMITED
WESTON • ONTARIO • CANADA

DIXIE PRODUCTS, INC.

Kelvinator

WESTINGHOUSE

CROWN • STOVE • WORKS

Mt. Vernon Furnace & Mfg. Co.
HEATING AND COOKING EQUIPMENT
Mt. Vernon, Illinois

GENERAL STEEL WARES

Hotpoint Co.

EAGLE RANGE & MANUFACTURING Company

PER

Alternate methods of attachment may be used.

These well known names and trademarks represent some of the leading manufacturers of gas and electric ranges currently using PERMA-VIEW windows.

RMA-VIEW

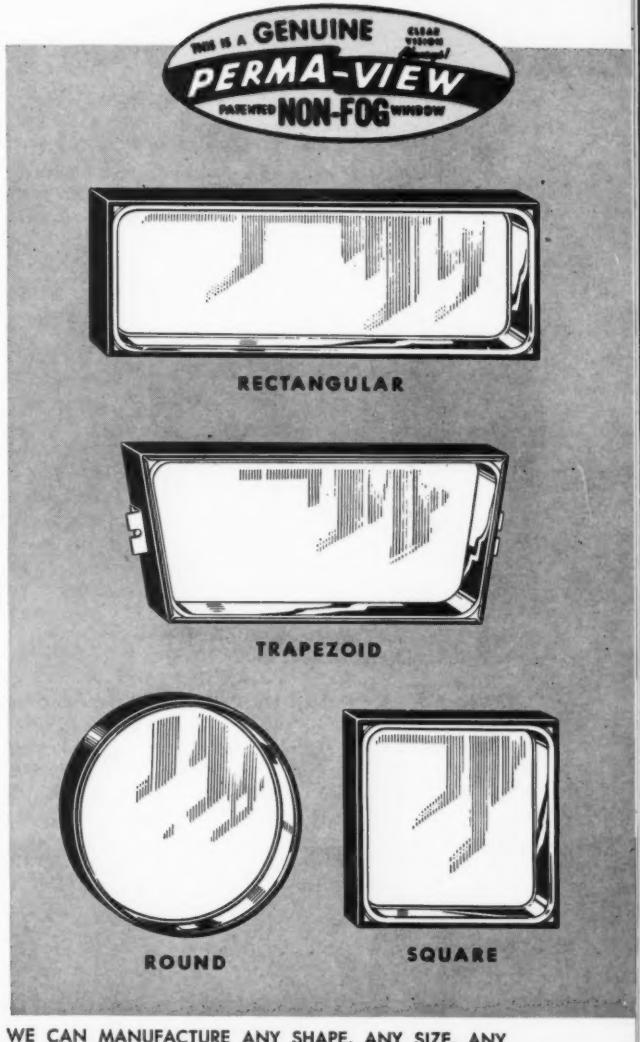
THE BEST SALESMAN FOR YOUR BUILT-IN OVEN...

With the growing trend to built-in appliances more and more leading manufacturers of built-in oven units have turned to PERMA-VIEW "the window you can see through always."

The strong steel encased, double pane PERMA-VIEW window incorporates the finest quality heat resisting glass. It is mechanically sealed to prevent infiltration of vapors and to eliminate "fogging." This "No-Fog" window meets the constantly growing demand for "visible baking."

As a practical, economical and effective sales feature PERMA-VIEW can be your best salesman. Be sure you take advantage of this sales feature in your new built-in models.

The PERMA-VIEW window is pre-engineered, and comes to you ready for immediate installation in your range. "Out of our carton into your door." Let our specialized production lines serve as a part of your subassembly facilities. Phone or write us for complete details on the ease and economy of adding this important sales feature.



A phone call or letter will bring an experienced engineer to your plant for prompt consultation. PHONE: Market 4-1591 WALLED LAKE, MICHIGAN

WE CAN MANUFACTURE ANY SHAPE, ANY SIZE, ANY THICKNESS TO MEET YOUR ENGINEERING REQUIREMENTS. RECTANGULAR — ROUND — SQUARE — TRAPEZOID.

MILLS PRODUCTS INCORPORATED

1015 WEST MAPLE ROAD • WALLED LAKE, MICHIGAN

FOUR-FOOT CAKE helps Toastmaster Products Div., McGraw-Edison Co. celebrate two occasions at once. It marks the 110th birthday anniversary of Thomas Alva Edison and the merging of the two firms, McGraw Electric Co. and Thomas A. Edison, Inc., For Toastmaster's ceremony, Murray Ireland, president of the division, cuts the first slice of cake. Taking part in the plant observance were Elgin (Ill.) Mayor Orlo Salisbury (center) and Walter Eardley (right), veteran of 36 years with Toastmaster.

RADIATOR PARTS made of stainless steel are held by Phyllis Jakeway, a secretary at Allegheny Ludlum Steel Corporation. The parts were fabricated by McCord Corporation, pioneer radiator manufacturer, and are presented as the first radiator service parts in automotive history made of stainless steel. These parts, requiring two pounds of stainless, are the top and bottom tanks and baffle plate.

LEWYT ZEPHYR, on sale March 1, is new vacuum cleaner in two-tone blossom and shell pink. The all-metal Lewyt Zephyr is extremely light. It rolls easily, and has swivel action without suction loss. Newly-designed nozzle cleans easily under low furniture, and makes use of cleaner's full power to get deep-down dirt.

the MPM . . .

on the theory that one photo equals one th ture will bring you many photos and fe equipment in the fabricated m

WHEEL HATS — Jessie Cartwright, Norge home service director, surveys line of home service girls, arrayed in pre-spring millinery fashioned with the Norge "dispenser wheel". Home service people attending distributor convention: (l. to r.) Gloria Perry, Chicago; Bob Ann Taylor, Oklahoma City; Barbara Bloom, Chicago; Edna Poyner, San Francisco; Edna Towery, Atlanta; Ann Glenn, Pittsburgh; Dorothy Glover, Philadelphia; and Sandy Healy, Boston.

ALLIED VAN LINES PULLING
bryant
50 YEAR SALES CARA
CARRYING GOLDEN FURNACES · AIR CONDITIONERS & WATER HEATERS TO BRYANT
AIR CONDITIONING · WATER HEATING

LARGEST PADLOCK guards Bryant's golden products. Bryant sales officials, at the company's new Indianapolis office building, unlock the "world's largest padlock." Occasion was

FLOOR TREADS for stair landings and floors, called "Safestride", have been added to the line of safety stair treads manufactured by Wooster Products, Inc., Wooster, Ohio. The treads are made with a permanent, heavy-duty, non-corrosive aluminum alloy base. They have rows of locked-in safety ribs containing abrasive aggregate similar to the material used for grinding wheels, and are anti-slip wet or dry.

MEET KATE SMITH. — When Maxine Adams, operator of Maxine's Youngstown Kitchens store in Richmond, Ind., visited the Youngstown factory in Warren, O., recently, she was introduced "by proxy" to Kate Smith who will star in the firm's hour-long TV show on April 28. The cardboard cut-out of Miss Smith will be used by dealers in store displays.

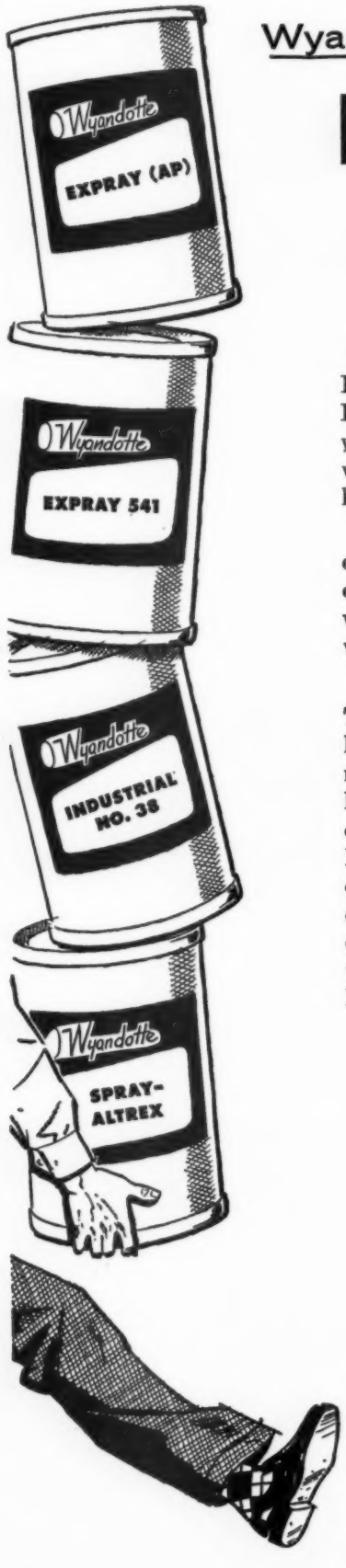
. . . . . foto-news

**ls one thousand words this MPM foto-news fea-
s and few words about people, products and
ricated metal products field . . . .**

SHAVEX is a small precision electric device that converts alternating current to direct current for faster and smoother shaves with any AC/DC electric shaver. The shaver is plugged into the Shavex which is, in turn, plugged into an AC outlet. Offered by Waring Products Corp., a subsidiary of Dynamics Corp. of America.

departure of first vanload of furnaces and air conditioners — new 1957 Golden Anniversary line. Shown (l. to r.), are: Al Frazier, Mike Fortier, H. L. (Red) Clary, and Bill Chappell.

WEIGHT TEST — While steel kitchen cabinets normally would not be called upon to withstand such rigorous treatment, this test by Republic Steel Kitchens aptly demonstrates their durability. Four standard 21-inch Republic base cabinets are shown supporting a 1957 Plymouth sedan weighing almost two tons. Despite heavy load, all doors and drawers operated during and after the test, and the cabinets themselves showed no signs of strain or wear.



Wyandotte spray cleaners

keep parts clean, every step of the way!

Rust-inhibiting EXPRAY (AP)

For hot or cold use on all metals. Low, controlled foaming in all washers. Prevents rust; non-scaling with any water; works even with heavy soil loads.

EXPRAY (AP) is excellent for chip, grinding dust, and fabricating-oil removal in one-stage washers. Works well in multi-stage washers, too.

Low-foaming EXPRAY 541

This Wyandotte spray cleaner is highly silicated to provide built-in maximum detergency — removes heavy drawing compounds, buffing compounds, and machining oils. It is designed for use on all metals except aluminum; built for heavy-duty use with heavy soil loads; can be used in highest pressure washers without foam problems. Non-dusty, easy-to-handle.

Heavy-duty INDUSTRIAL No. 38

For heavy-duty spray washing, Wyandotte offers INDUSTRIAL No. 38. This free-rinsing, alkaline cleaner is essentially anhydrous — all cleaner. No built-in water.

Heavy-duty Industrial No. 38 has been an industry standard for years, unexcelled for handling those tough jobs on steel, brass, and zinc die castings.

New SPRAY-ALTREX

The newest and best spray cleaner for aluminum. Removes all aluminum soils, including stencil ink, without etching. Low foaming at all temperatures in all washers. For hot or cold use. A non-dusty product which gives excellent performance, even under the most adverse conditions.

Get free information today!

Wyandotte has custom-designed these cleaners to meet the problems encountered in spray cleaning between machining operations, and other special applications. To get details on how they can solve your particular spray-cleaning problems, contact your Wyandotte man, today. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*

Wyandotte CHEMICALS

J. B. FORD DIVISION

THE BEST IN CHEMICAL PRODUCTS FOR METAL FINISHING

to your
specifications...

lightweight aluminum

Portable TV Cabinets

fabricated and
finished by
REYNOLDS ALUMINUM
FABRICATING SERVICE

get sales appealing beauty, economy and quality in aluminum

Portable TV Cabinets from Reynolds

Today's modern portable TV sets (and the competitive market) require cabinets of strong, lightweight, rustproof, attractive materials—economically fabricated. You get *all* these advantages when Reynolds fabricates and finishes your portable TV cabinet parts in aluminum. Here's why—

Reynolds has the facilities for assuring economy. Modern fabricating facilities that assure you the right equipment for each component you order. Facilities that help solve manufacturers' problems such as lack of production capacity, floor space, material handling costs, capital for raw materials.

Reynolds offers the finest facilities for finishing aluminum available anywhere. Reynolds is equipped to add value to your portable TV cabinets with mechanical, chemical and painted finishes—and with gleaming, sales appealing, *color anodized* finishes—in-the-metal finishes that will never chip or pit or flake or rust.

Reynolds guarantees quality . . . and controls it from mine to finished component—with technological know-how in producing and fabricating aluminum.

Consider all the advantages that aluminum offers in portable TV cabinets. Consider the advantages that Reynolds Aluminum Fabricating Service offers you in fabricating and finishing your cabinets. Then *before* you start planning your new models, contact your nearest Reynolds Office or write to the address below. Get the full details on Reynolds fabricating and finishing facilities and on Reynolds engineering and design service.

ALUMINUM IS THE IDEAL MATERIAL FOR ALL PORTABLE APPLIANCES

REYNOLDS ALUMINUM FABRICATING SERVICE

2006 South Ninth Street • Louisville 1, Kentucky

BLANKING • EMBOSSING • STAMPING • DRAWING
RIVETING • FORMING • ROLL SHAPING
TUBE BENDING • WELDING • BRAZING • FINISHING

The Finest Products Made with Aluminum are made with REYNOLDS ALUMINUM

TRUMP CARD for SPECIALS
..TO YOUR DESIGN!

A SUBSIDIARY OF BARIUM STEEL CORPORATION

Contact your Cuyahoga representative

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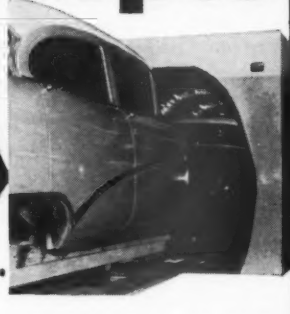
leading auto manufacturers install clepco QUARTZ OVENS



Here's Why...

CLEPCO Quartz Paint Ovens are based on the use of special CLEPCO Quartz Heaters designed to emit that part of the heat spectrum most readily absorbed by paints.

Another major auto manufacturer reports that CLEPCO Paint Ovens are lower in original cost as well as in operating costs than the conventional gas fired convection ovens previously in use.

CLEPCO'S Complete Research Facilities are at your service to determine the most efficient quartz oven for your requirements.

SEND FOR COMPLETE INFORMATION

THE CLEVELAND PROCESS COMPANY

1965 EAST 57TH STREET • CLEVELAND 3, OHIO

ELCO SCREWS ARE GOOD SCREWS
Ask a man who has used them

SMALL SCREWS Special equipment and special engineering and tooling experience enable us to offer a broad line of screws of various types in the smallest sizes for which dimensions are standardized. These include body diameters as small as No. 0 and lengths as short as ⅛". They can be made in any of our standard and special materials, and with any of our regular finishes. Engineering or design assistance is available whenever needed. Stock is carried in many sizes — write for our Small Screw Stock List and free samples. *Send your prints for prompt quotation!*

WOOD SCREWS	THREAD-CUTTING SCREWS	STOVE BOLTS
MACHINE SCREWS	PHILLIPS AND SEMS SCREWS	CAP SCREWS
MACHINE SCREW NUTS	PIPE PLUGS	LAG SCREWS
TAPPING SCREWS	COLD HEADED PRODUCTS	DRIVE SCREWS
		SPECIAL SCREWS

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ELCO SCREWS

WE ALSO SPECIALIZE IN MAKING ANY OF OUR PRODUCTS OF THE FOLLOWING MATERIALS

Stainless Steel	Copper	Monel
Bronze	Silicon Bronze	Aluminum
Brass	Ambrac	Special Analysis

ELCO TOOL AND SCREW CORPORATION

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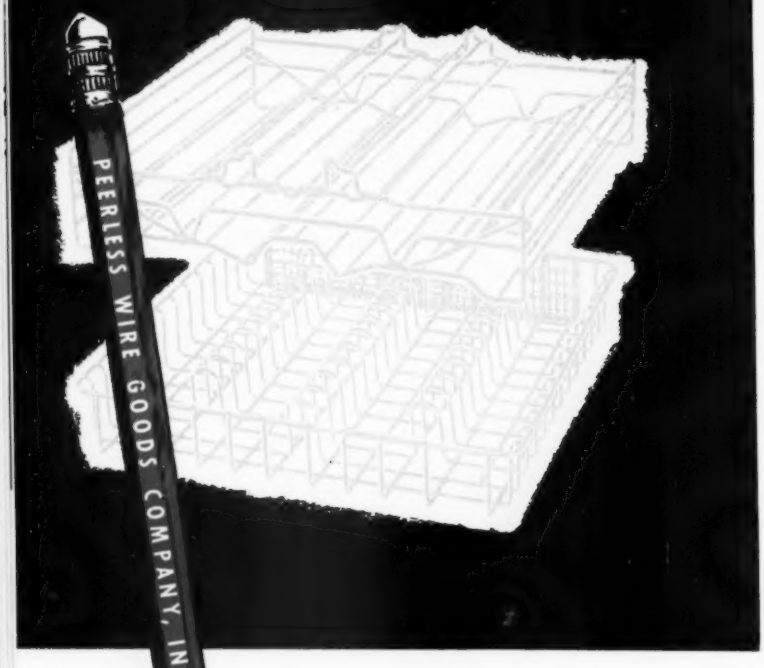

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Sharp Pencil

THAT

Delivers Quality

Quality has a way of suffering when price is figured on wire goods because the margin between cost and quotation can be increased by sacrificing quality.

Not so, however, at Peerless, for our facilities and experience have been delivering quality and price for nearly 50 years.

When formed wire products are a factor in your production costs, check with Peerless and be assured of quality at the lowest price.

Your blueprints and specifications by mail will bring you a quotation based on design know-how and experience in producing quality to a price.

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2702 FERRY STREET • LAFAYETTE, INDIANA

"Peerless Products Please"

ESTABLISHED 1910

INDUSTRY MEETINGS

AIR CONDITIONING SYMPOSIUM

Air Conditioning Symposium, Auditorium of the Dept. of Commerce Bldg., Washington, D. C., April 3-4, 1957.

SCREW MACHINE PRODUCTS

Annual Spring Meeting of the National Screw Machine Products Assn., Shoreham hotel, Washington, D. C., April 7-11.

GAS APPLIANCE

The Gas Appliance Mfrs. Assn., annual meeting, The Greenbrier, White Sulphur Springs, West Virginia, April 8-10.

PACKAGING EXPOSITION

National Packaging Exposition and National Packaging Conference, American Management Assn., International Amphitheatre, Chicago, April 8-11, 1957.

WELDING SOCIETY

National Spring Meeting of American Welding Society, and Fifth Welding and Allied Industry Exposition, Hotel Sheraton and Conventional Hall, Philadelphia, Pa., April 8-12, 1957.

SMALL-LOT STAMPINGS

Small-lot Stampings Talk, HPL Mfg. Co., Brass Rail, New York City, April 11, 1957.

HOME LAUNDRY

American Home Laundry Manufacturers' Assn. Annual Meeting, French Lick-Sheraton hotel, French Lick, Ind., April 14-17.

BUILDING RESEARCH

Sixth Annual Meeting of the Building Research Institute, Drake hotel, Chicago, April 15-17, 1957.

HEATING AND COOLING

Short Course on Heating and Cooling with Forced Air will be held at University College, Syracuse 2, N. Y., April 15-18, 1957.

CONFERENCE ON ELECTRONICS

Conference on Electronics in Industry Sponsored by Armour Research Foundation and Professional Group on Industrial Electronics, Institute of Radio Engineers, Illinois Institute of Technology Campus, Chicago, April 24-25, 1957.

INDUSTRIAL RESEARCH

National Industrial Research Conference sponsored by Armour Research Foundation, Conrad Hilton hotel, Chicago, April 24-25, 1957.

AIR CONDITIONING & REFRIGERATION

Air Conditioning and Refrigeration Institute's Annual Meeting, The Homestead, Hot Springs, Va., May 5-8.

CERAMIC SOCIETY

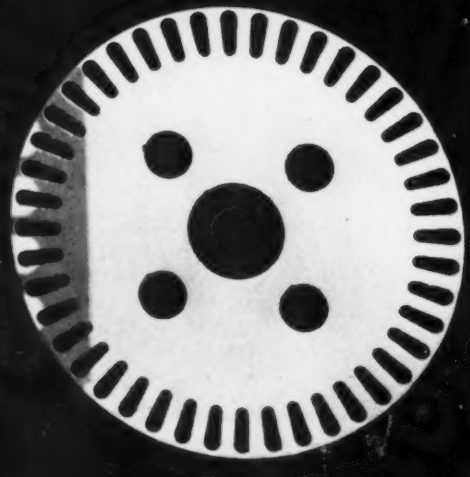
The American Ceramic Society's 59th Annual Meeting, Statler-Hilton hotel, Dallas, Texas, May 5-9, 1957.

ARCHITECTURAL METAL

National Assn. of Architectural Metal Manufacturers' 19th Annual Convention, Fairmont hotel, San Francisco, Calif., May 7-12, 1957.

MIDWEST ENAMELERS

Midwest Enamelers Club Maypole Party, White Pines Country Club, Bensenville, Ill., May 24, 1957.



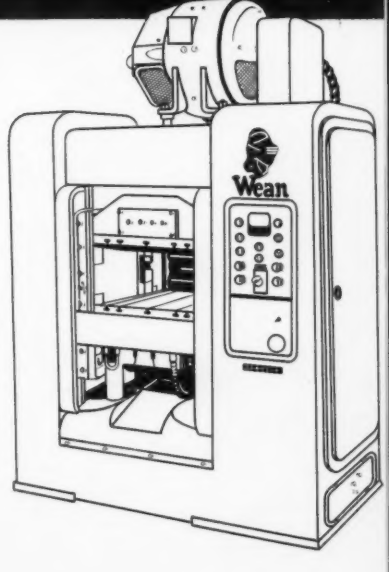
What shape is your production in?

Production Rate:

Conventional Press — 180 two-piece units per minute.
Wean "Flying Press" — 300 two-piece units per minute.

Both of these electric motor parts, measuring 3½" and 5½" in diameter respectively, were produced in a single set-up on a conventional press at the rate of 180 per minute. Using the same dies, the "Flying Press" produced these parts at the rate of 300 per minute. This is typical of the type of production rates that result when the job is done on a "Flying Press."

Although engineered for the ultra-high speeds, the "Flying Press" offers other major cost-saving advantages too. For instance, since it has no brake or clutch to wear out, maintenance savings alone are an important consideration. But you'll want the complete story so . . . write today for your copy of the "Flying Press" brochure. It will open your eyes to new production horizons.



Wean Equipment Corporati

CLEVELAND 17, OHIO

1751-3

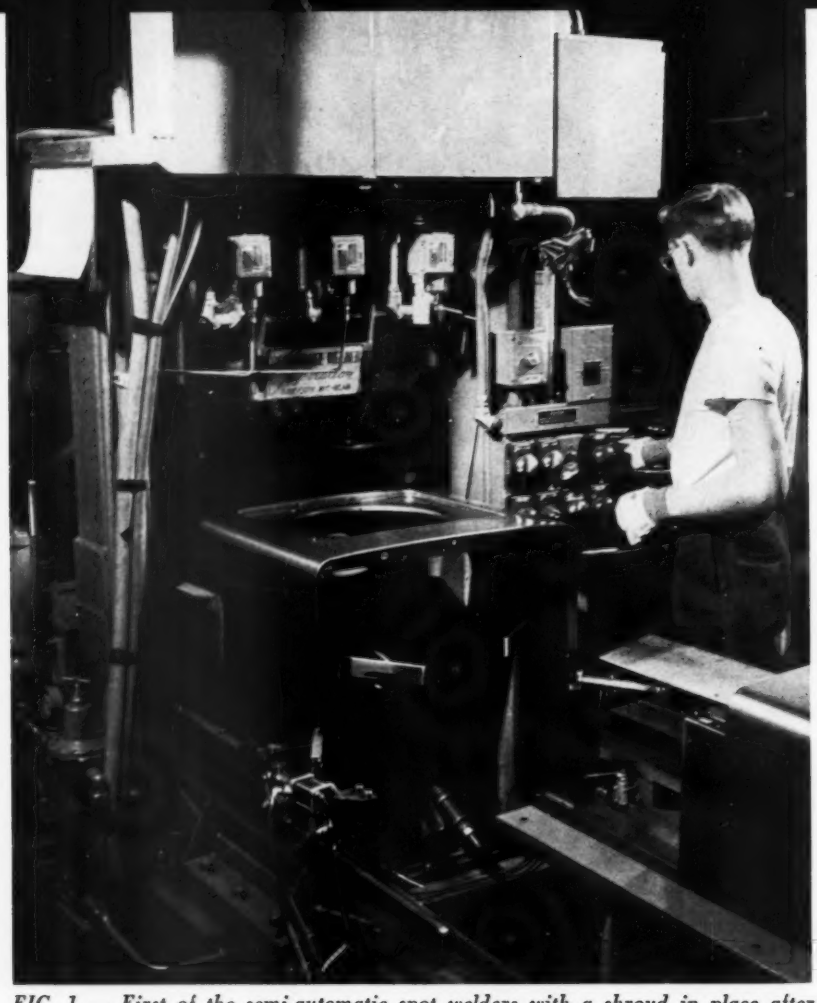
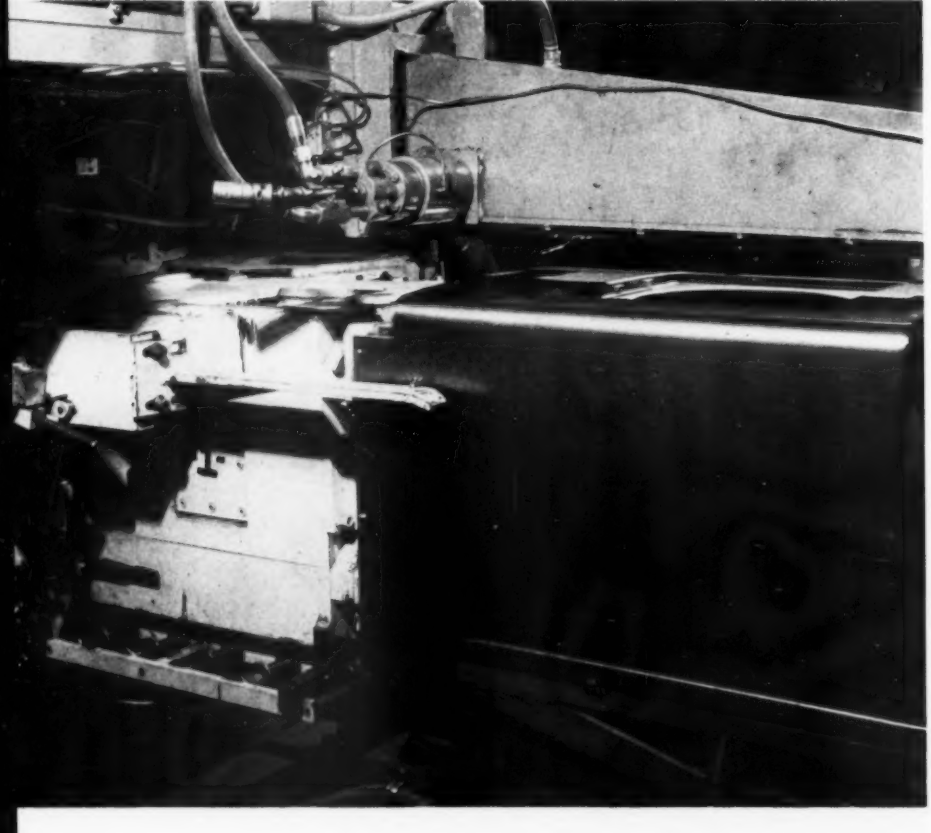


FIG. 1 — First of the semi-automatic spot welders with a shroud in place after feeding along the track that is part of the production line. Hinge and other small parts are added by hand and are clamped before being welded to the shroud.



Special machines a
aid rapid welding of

major cabinet component is ma

CABINETS for home laundry dryers built in the new Marion, Ohio, plant of the Whirlpool-Seeger Corporation are assembled from stamped components by spot welding. As the major component, called a "shroud," and includes a front and two side panels in one piece, is made at the rate of 275 an hour, and is fed directly into the assembly line, welding must be done at an equally rapid rate.

Accordingly, special fast welding machines and fixtures are provided and are so designed that loading, clamping, welding, and unloading can proceed as rapidly as the shrouds come from the production line. FIG. 1 shows the first resistance welder into which a shroud has been loaded on tracks that form a continuation of those used in final production processes. Four small parts, including hinge components, are put in place by hand. Air clamping and welding follow immediately the pressing of palm buttons.

Unlocking and indexing to the next welder, FIG. 2, then follows and (for gas heated models only) two stiffener strips are welded in place. All assemblies then are fed to the first loading

FIG. 2 — In this second machine, shrouds for gas operated dryers have stiffeners, which are placed by hand and then are air clamped, spot welded to the shell, which is then advanced to the capstan welder, Figs. 3 and 4.

nes and fixtures
ing of dryer cabinets

ent is made at rate of 275 an hour

station of a four-station resistance welder, FIG. 3. There, and in the second station, the operator, after seeing that the assembly, which is advanced by chains, is correctly located, adds an upper back panel (to complete the four-sided shell) and four gusset plates. When these are in proper position, they are air clamped at the second station.

When the fixture is indexed to the station, FIG. 4, all necessary spot welds are made automatically in rapid sequence. Then, after advance to the fourth station, clamps unlock automatically and chains discharge the weldment to a belt for advance to other dryer assembly operations, leaving the fixture ready for reloading.

Operations proceed simultaneously, most of them automatically, at all four stations of the machine, and it is indexed to keep step with production. Of course, the machine can be stopped in any index position should trouble occur, but the multiple-station arrangement gives time and space for loading and unloading while welding is being done at one station.

FIG. 3 — Operator of the capstan welder loading gussets and an upper rear panel at the second station. This is done after chains have advanced the shroud into the machine at the first loading station.

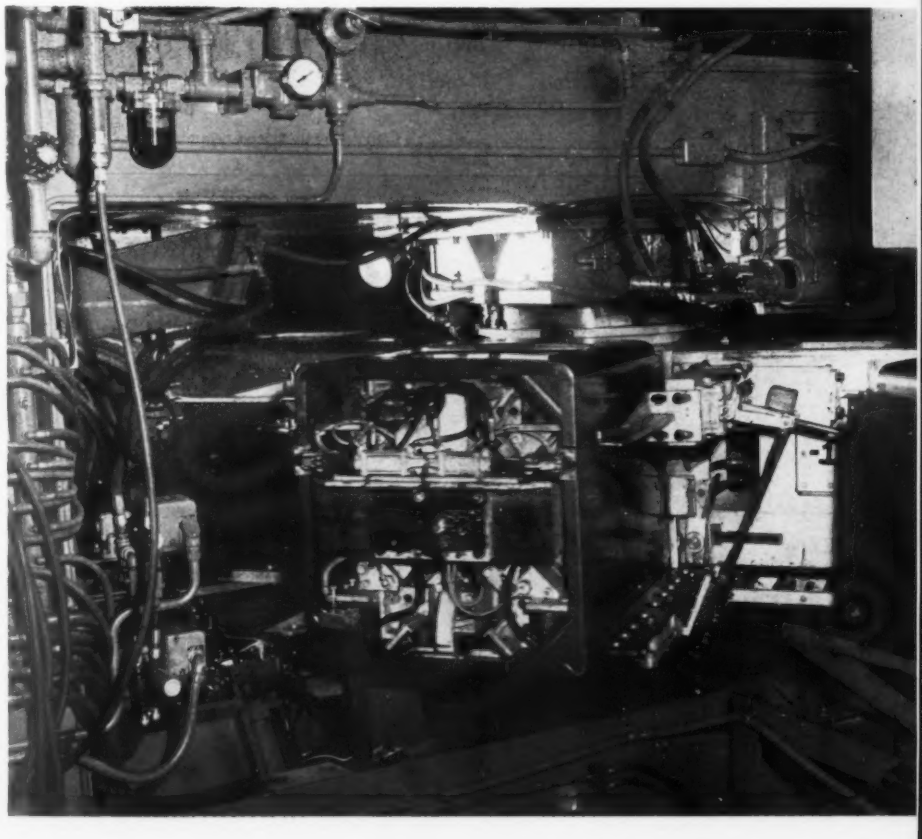


FIG. 4 — Capstan welder with a loaded fixture being indexed from the second loading to the welding station after all components have been air clamped in correct position. Operations proceed at all four stations after each indexing.

IN ELECTRICWARE, TOO,

Sharonsteel Quality STANDS OUT

• There are so many advantages to stainless electricware it's no surprise that sales are skyrocketing. Homemakers like the natural beauty of stainless — the way it easily absorbs the punishment of everyday use and stays forever new with a minimum of care.

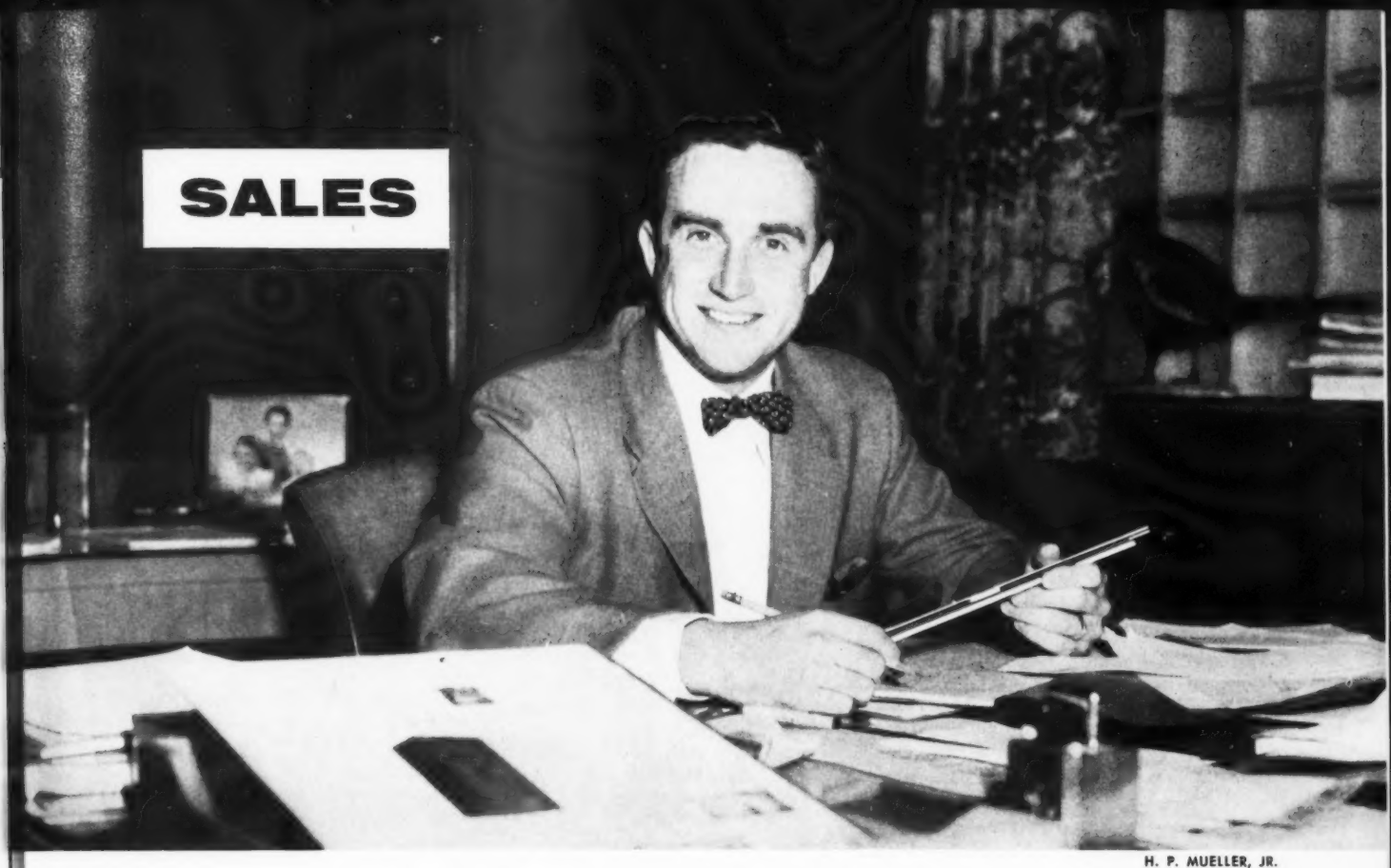
• Sharon's thorough knowledge of the utensil industry, the ability to produce specification steels of consistent uniformity, plus the finest finishes in the industry are reasons why so many of the nation's leading electricware manufacturers specify **Sharon Quality Stainless Steels.**

172

SHARONSTEEL *For 56 Years a Quality Name in Steel*

SHARON STEEL CORPORATION, SHARON, PENNA.

CHICAGO, CINCINNATI, CLEVELAND, DAYTON, DETROIT, GRAND RAPIDS, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, NEW YORK, PHILADELPHIA, ROCHESTER, SAN FRANCISCO, SHARON, MONTREAL, TORONTO



H. P. MUELLER, JR.

This sequel to a 20-page feature on Mueller's management, engineering, and manufacturing was released at the recent ASHAE show in Chicago.

Putting the accent on dealer support

Mueller Climatrol's sales and marketing director tells of his company's plans for strengthening dealer network—outlines new financial program

by H. P. Mueller, Jr. • VICE PRESIDENT, SALES

THE NECESSITY for intelligent sales leadership in the heating and air conditioning industry, from manufacturers, wholesalers and dealers, has never been more pressing.

The sales department has a primary responsibility of maintaining a sufficient backlog of orders to keep our factory operating at full capacity. This responsibility also includes the obvious necessity for continuous and uniform production, each day, each week, each month of the year, so that we fulfill our normal obligation to our employees by providing steady employment. Leveling the peaks and valleys of manufacturing curves, aside from the many obvious economies, permits stable employment and build-up of valued experience throughout our organization. Needless to say, an employee working in an atmosphere of job stability is better able to function as a member of the "Mueller team".

The accomplishment of sales goals necessitates comprehensive programing, a part of which certainly requires careful planning for the selection of and the stimulation of our customers.

No matter what channels of distribution our industry adopts, the dealer is the ultimately vital cog in the sales machinery. He must be healthy and vital if we are to accomplish the end of volume production with the most satisfactory return for the consumer.

A sales program that not only sells the required dollar volume per year, but sells it at the proper times, is obviously needed for an overall smooth running operation. Engineering support, product engineering training and education, dealer management assistance, advertising, promotion, publicity, service, inventory control assistance and keen awareness of financial problems, are all elements in a well rounded program.

However, the most important element of all is the salesman — the liaison between manufacturer and customer. We are confident that our salesmen are the best qualified to cope with the complexities of this industry. They have been well trained in every aspect of our program and have gained a well rounded knowledge of the products they sell.

They are vital and have the aptitudes necessary to perform their duties well.

We have strengthened every element of our sales program and are intensifying our efforts to strengthen the position of our customers, so that they can profit and plan for the "golden era" that has been forecast for our industry.

Buy early — pay later

The Mueller Climatrol Sales Anticipation Plan is an excellent example of the type of thinking that goes into this planning for increasing support of our customers. The plan is designed to be mutually helpful to our customers and to ourselves. The mechanics are quite simple. We offer our customers an opportunity to provide themselves with an adequate inventory in the early part of the year, with actual payment not required until some months later. Where necessary, trade acceptances or repurchase agreements are provided to strengthen the customer's normal credit situation.

Such a plan has many advantages, not the least of which is an improvement in our productive and shipping position during the early months of the year.

Under this plan, the customer may buy in quantity without tying up his working capital. With a full supply of products he is encouraged to sell as early in the year as possible, thus turning our inventory investment into accounts receivable, which will ultimately permit discounting of the bills for this equipment. The dealer can use some of this equipment for display, not only in his own shop, but in strategic locations in the community, which will improve his sales climate.

Price protection for dealers

The Sales Anticipation Plan guarantees against price decline. If our prices should go down, he will be credited with the amount of this decline on equipment still remaining in his stock. If prices rise, he is provided obvious protection for himself.

This program permits our customers to buy in truckload or carload quantities, so that they may avail themselves of the additional quantity discounts for volume shipments. This also provides substantial savings in freight.

The whole program results in mutual benefits for us and our customers.

This is but one facet of our dealer support program. Yet it illustrates our recognition of the mutual dependence of customer and manufacturer on one another. The most extensive advertising and promotion program in the company's history, the consistent development of new products required by market trends, the intensive effort to help our customers improve their profit picture, will certainly continue our rapid growth trend.

Our sales objectives are clear. We intend, through proper sales programing, to provide smooth running operation for ourselves and for our customers and to grow with one another, rather than at the expense of one another.

After 100 years, our outlook is brighter than ever before in our history.

Ten million air conditioned homes in the next five years?

MPM report from a press conference with Mueller Climatrol officials

THE aggressive campaign by one manufacturer to "mend his own fences" in the face of wide unrest throughout the heating and air conditioning industry was presented February 25 before a group of industry trade press editors. The story of the manufacturer's efforts was told by Frank J. Nunlist, Mueller Climatrol's executive vice president, at a special press breakfast as the industry met for the 7th International Heating and Air Conditioning Exposition in Chicago's Amphitheatre.

There is no conceivable reason why our Industry cannot sell 2½ million furnaces in 1958, said Nunlist.

With 50 million dwelling units in this country, one furnace for each 20 homes would provide this volume without a single new residential structure being erected. Yet, we know that a million dwelling units is a bare minimum for our Industry. The fact that we only sold a few hundred thousand furnaces in the modernization market in each of the last several years is a sad commentary on our woeful lack of consumer recognition and on our own public relations and merchandising abilities.

"At the present rate of modernization sales, it will take 50 years to replace the automatic, central heating installations that now exist in single-family dwellings," he proclaimed.

"Product styling, appreciation of the direct benefits to health and modern living that accrue from the possession of a 20th Century heating unit, must be brought home to the public at large if we are to play our fair and proper role in the American economy."

Dealer criticism comes home

The manufacturers of this Industry have criticized the dealers for waiting on the market — yet, we have been guilty of the selfsame mortal sin. Mueller Climatrol will no longer wait, said the Mueller executive.

Explaining the company's program to the industry press, Nunlist continued: "Smugness," he said, "may well sound the death knell for the industry, as we know it today, unless something drastic is done. The average heating and cooling dealer is way behind the times. He is attempting to use sales methods that were part of the pre-war economy —ignoring the tremendous change in merchandising techniques which now guide public acceptance."

"Moreover, the air conditioning market has reared its head and seems assured of a tremendous growth. One industry official has predicted there will be 10 million centrally air conditioned homes in the next five years alone."

"The ability to handle this tremendous market is already in the heating and cooling dealer's hands. He has the warehousing facilities, the trucks, the tools. He has the mechanically trained personnel to do the job. He understands piping and duct work, and installation engineering."

"More than that, he has a better knowledge of the techniques of in-the-home selling than any other dealer group. He has a background of experience in domestic financing. Above all, he has learned to live with the demands of domestic service and its peculiarities."

But, despite this, the average heating and cooling dealer has failed to combine the tools he already has with the modern attack weapons that he needs. Many key dealers recognized and solved this problem long ago. But in too many cases, the average dealer has treated the air conditioning market the same way his father handled the

to Page 33 →

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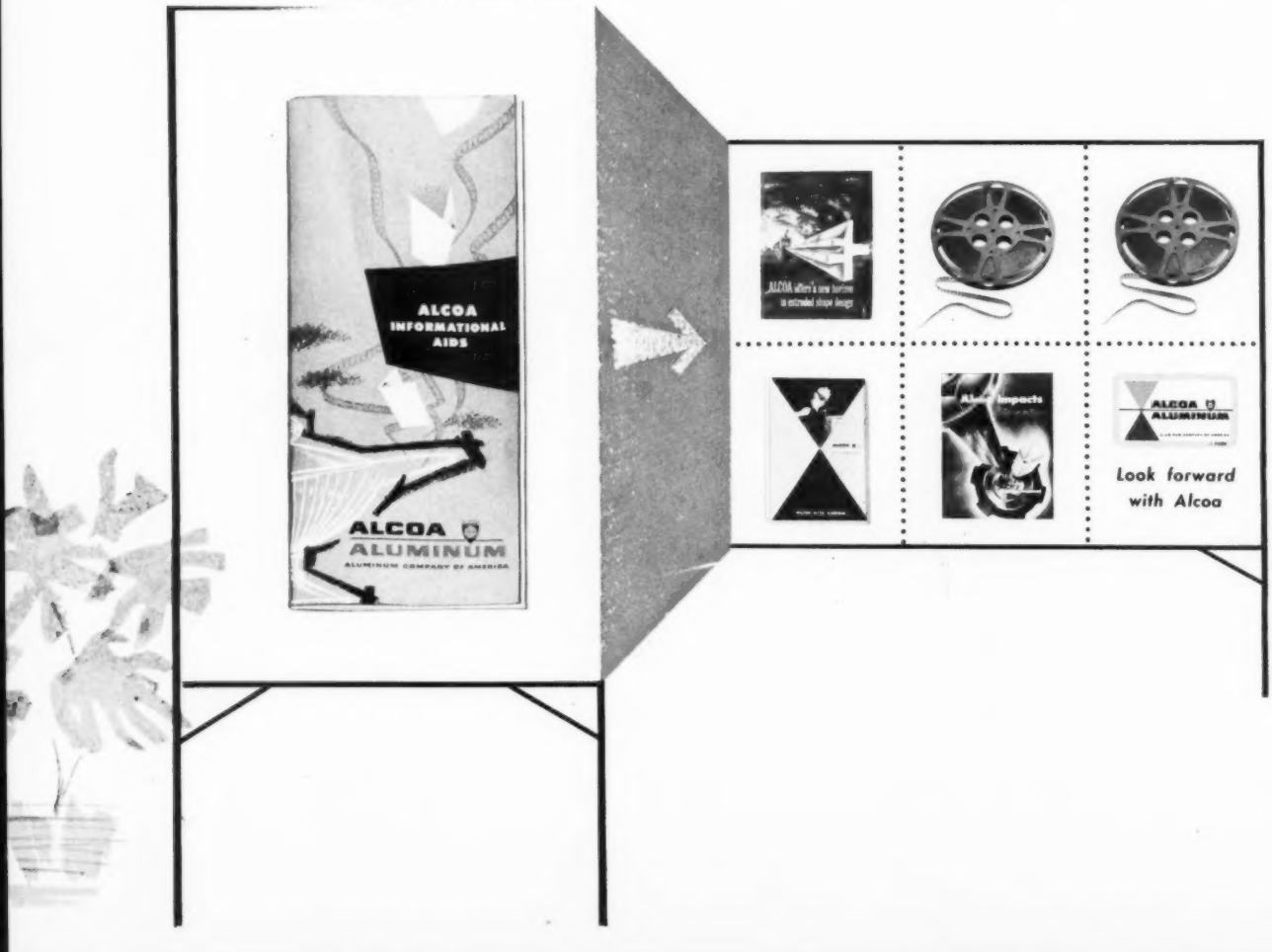


Mueller press conference

→ *from Page 30*

furnace business, waiting for the customer to call on him.

The truth of this situation was boldly defined when the duPont surveys were released. These revealed that 80% of all central air conditioning systems were purchased by the home builder or home owners calling on the dealer. This means that four out of five actual sales were made *in spite of* dealer inactivity.

"The tragedy is that unless the furnace dealer aggressively takes over the cooling installation business, he will find himself out of the heating business as well."

The "fast-pitch" appliance dealer

"Some manufacturers, pressured by the high investment in product manufacture, and needing output to keep their costs competitive, may well be forced to turn to the fast-pitch appliance dealer, accepting his method of merchandising and tailoring the products to his needs . . . "

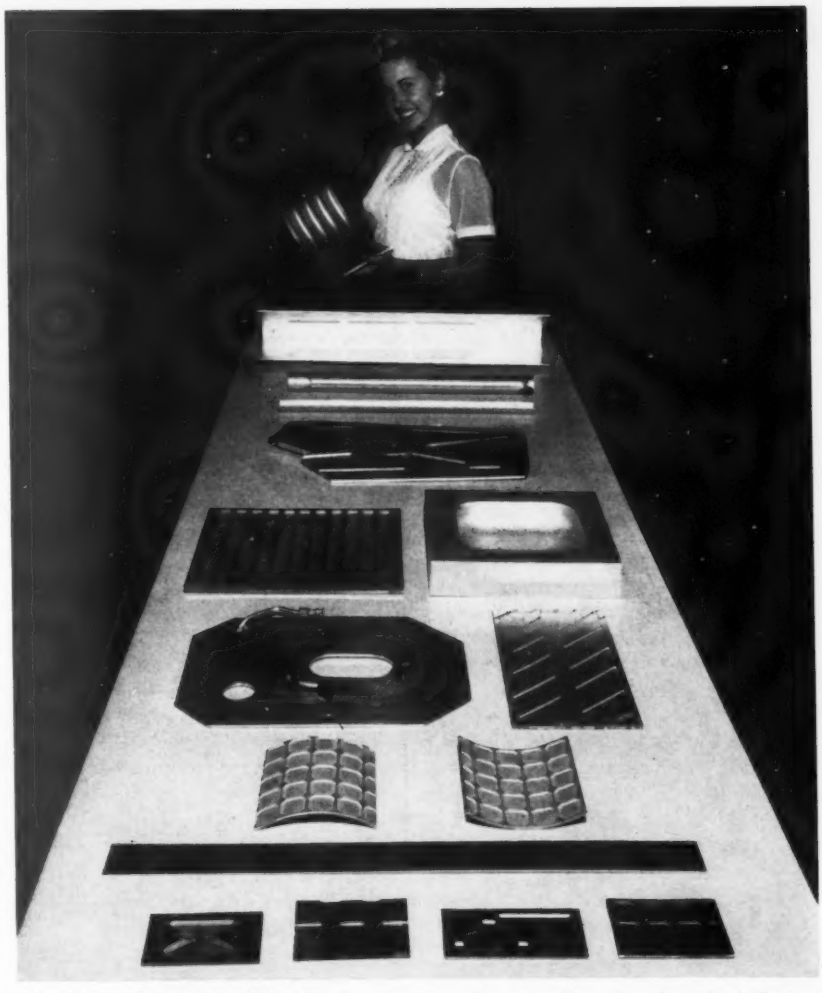
"The continuing growth in grief brought to the heating and air conditioning market by the manipulations of today's appliance merchandisers is familiar to us all. The appliance dealer sells products which he can take out of the case and plug into the wall. He seldom has the organization or the technical knowledge to properly handle the equipment which our industry manufactures.

"But, we must admit that the appliance dealer has certainly learned how to sell. Every merchandising avenue from skyrocket displays to free whoop-lavian smorgasbord has been used in the dealer's sales' operations to drag in customers and make the cash register sing. No one can deny the success he has achieved . . . "

"The successful dealer must be a profit making dealer," Nunlist told the group. "A system of management guides was developed by the Mueller Climatrol organization. Moreover, to always keep on top of the problems, a dealer council, made up of representative dealers throughout America, has been set up and will be able to spot problems as they occur, or even before. We have done away with *waiting in our office until someone tells us what is going on. We are going out and find out for ourselves* . . .

"Results so far have been excellent, sufficient to assure us that we are on the right track. We now feel that we may have the answer to the problem — an answer which we hope will serve as an example to the industry, manufacturer, and dealer.

"The return to stability, to positive progressive action for heating and air conditioning equipment manufacture and sales, can only come with the cooperation of all of us, as an industry of manufacturers, as an industry of dealers," Nunlist asserted.



MILLING WITH CHEMICALS is a process that is taking its place in industry, not as a replacement for conventional milling practices, but to do many jobs on odd-shaped parts "that couldn't be machined." In this photograph are typical parts produced by chemical milling, or etching to shape, through the use of a chemical solution combined with masking techniques. Extremely complicated parts can be "milled" through the use of this method.

NEXT MONTH: — See "Milling With Chemicals," an article by Gilbert C. Close, Western Editor for MPM.

H. P. Mueller, Sr., president of Mueller Climatrol, Milwaukee, Wis., is interviewed at recent press conference by MPM Editor Dana Chase.

Effect of ceramic coatings on creep of alloys

a report of an investigation for the Wright Air Development Center

by J. R. Cuthill, J. C. Richmond, and N. J. Tighe • ENAMELED METALS LABORATORY, NATIONAL BUREAU OF STANDARDS

REFRACTORY-TYPE ceramic coatings have come into widespread use on metal parts exposed to high temperatures, as in aircraft engines. The coatings protect the metal at high-temperatures against the various corrosive atmospheres in which these parts normally operate. The ceramic coatings also affect the creep rates of some alloys under stress at high temperatures. The National Bureau of Standards recently undertook a study of this creep behavior under different temperature-stress conditions. Results indicate that under some conditions a coating can reduce the creep rate as much as 50 per cent, while under other conditions, a deleterious effect is observed.

The creep characteristics of a metal can limit its useful life; thus the effect of ceramic coatings on creep properties is of considerable practical importance. The NBS ceramic coating N-143, which contains cerium oxide for refractories, was chosen for this investigation. It was applied to specimens machined from thin sheet metal. The alloys studied are representative of materials that have good high-temperature oxidation resistance. These materials include two 80Ni-20Cr alloys (designated as "Lot A" and "Lot C") differing significantly in manganese, iron, and silicon content. Both coated and uncoated samples were tested in a conventional controlled-temperature furnace designed for creep testing. Extension of the specimens was measured by sighting with a telescope through a window in the furnace onto a platinum extensometer fastened along the gage length of the specimen.

Of the various combinations of stress and temperature imposed, those at 1975°F and 600 and 1200 psi showed the greatest reduction in creep rates of the ceramic-coated specimens when compared with the uncoated specimens. Under these conditions the beneficial effect of the coating on the creep behavior of both 80 Ni-20Cr alloys is sufficient to be of practical importance. At 1975°F and 600 psi the creep rate of uncoated Lot A specimens is higher than that of Lot C. However, the reduction in creep rate imparted by the ceramic coating is so much greater in the case of the Lot A alloy that the creep rate of the coated Lot A specimen is significantly lower than that of the coated Lot C specimens.

Table 1

Report of Chemical Analyses of the Two 80Ni-20Cr Alloys Tested

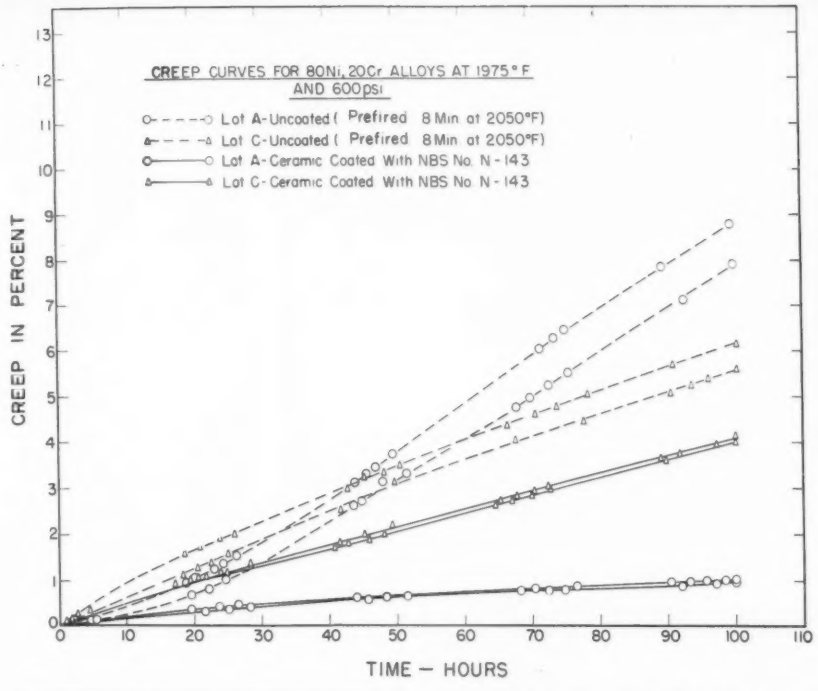
Constituent	Weight Percent	
	80Ni-20Cr (Lot A)	80Ni-20Cr (Lot C)
Cr	19.14	19.67
Mn	1.80	.24
Si	1.28	.82
Fe	.61	.10
Co	*	.07
Al	.10	.01
Zr	.09	.050
Ca	.038	.032
Cu	.03	.04
C	.03	.02
P	*	.01
Pb	*	.002
S	*	.001
B	*	.0005
Ni	bal.	79.04

* Not reported

Extensive internal void formation was observed in the uncoated specimens tested at 1975°F and at 1900°F. Analysis showed that the uncoated specimens lost twice as much chromium as the coated specimens that were tested at the same temperature. Very little void formation was observed in the coated specimens which had been tested at either of these temperatures. Furthermore, no void formation was observed in coated or uncoated specimens tested at 1800°F. constant for the entire duration of the test for both Lot A and Lot C alloys. However, at 1800°F and 2200 psi the

At 1900°F and 900 psi and at 1975°F

Fig. 1. Operator observing creep behavior of ceramic-coated metal specimen in furnace at the National Bureau of Standards. Results of a study of the creep behavior of alloys under different temperature-stress combinations indicate that a ceramic coating can reduce creep rate as much as 50 percent under some conditions.


CREEP CURVES FOR 80Ni, 20Cr ALLOYS AT 1975° F AND 600psi
Lot A-Uncoated (Prefired 8 Min at 2050°F)
Lot C-Uncoated (Prefired 8 Min at 2050°F)
Lot A-Ceramic Coated With NBS No. N-143
Lot C-Ceramic Coated With NBS No. N-143
CREEP IN PERCENT
TIME — HOURS

N-143 coating is not sufficiently fluid at 1800°F to follow the deformation of the specimen at the very high strain rates occurring in these alloys when a stress of 2200 psi is applied and that it therefore cracks. Profuse cracking of the coating was observed in all of the coated specimens that failed in test at 1800°F and 2200 psi but in no other specimens. Presumably, at higher temperatures the N-143 coating, being more plastic than at lower temperatures, was able to follow the deformation of the specimens at strain rates as high as those observed at 1800°F and 2200 psi.

Fig. 2. Creep curves for two coated and uncoated 80 Ni-20 Cr alloy specimens under stress at an elevated temperature. Results show that the beneficial effect on the creep behavior of both alloys is sufficient to be of importance.

Table 2

Mill batch composition of the N-143 Coating:—

Ingredient	Parts by weight
N. B. S. Frit No. 435	67½
Cerium oxide, CeO_2	32½
Enameler's Clay	5

Computed melted oxide composition of Frit No. 435:—

Oxide	Mole Percent
SiO_2	51.02
BaO	25.51
BeO	10.20
P_2O_5	2.04
CaO	6.12
ZnO	5.10

and 600 psi the creep rate was virtually initial creep rate was comparatively low. After about 20 to 30 hours the creep rate rapidly increased for a few hours and then became gradually less again.

At 1800°F and 2200 psi, the initial creep rate of ceramic-coated specimens was well below that of the uncoated specimens. The creep curves of the coated specimens usually remained below the curves of the uncoated specimens during the first 20 hours. However, during a period of rapidly increasing creep rate beginning about 20 to 30 hours after the start of the test, coated specimens generally showed an even greater rate of increase than the uncoated; fracture of the coated specimens usually occurred during this period. One ceramic-coated specimen, which did not fail under test for more than 1200 hours, showed significantly greater creep after the first 100 hours than did the uncoated specimens.

In general, the results suggest that the

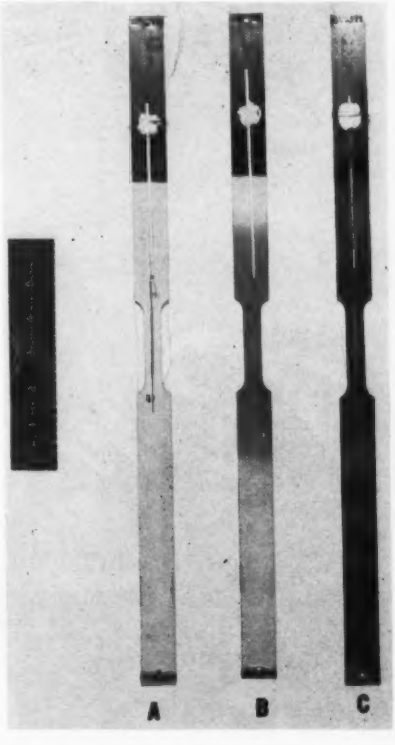


Fig. 3. Machined sheet-metal specimens used in the study of creep behavior of ceramic-coated metals. All specimens shown here are of the same 80 Ni-20 Cr alloy. Specimen A, shown before test, is coated with NBS ceramic N143. Specimen B is same as A, but after 100 hr. at 1975°F and 600 psi stress. Specimen C is an uncoated specimen subjected to the same time-temperature-stress conditions as B.

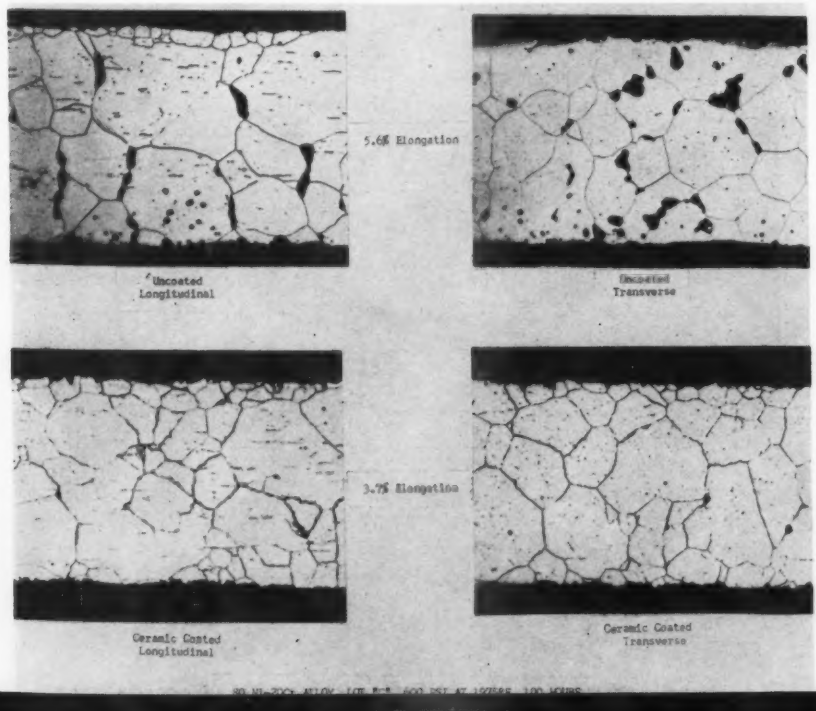


Fig. 4. Photomicrographs of cross sections of fired coated and uncoated specimens. Uncoated specimens show considerable void formation, while little or no void formation occurred in the coated samples.

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Properties of low temperature porcelain enamels

by H. P. Tripp • GENERAL ELECTRIC COMPANY

THE low temperature enamels currently available for sheet steel fire at temperatures from 950° F to 1350° F. Most of these are in the range of 1250° F to 1350° F. Both lead-bearing and lead-free enamels are available at any of these temperatures. Two areas of interest concerning these enamels are: workability and aging of slips, and the properties of the fired enamels. The first of these affects the ease of utilizing existing equipment and procedures, and the second affects the utility of the final product.

The workability of slips of these enamels compares favorably with that of conventional enamel slips. With proper adjustment ground coats can be dipped or flow-coated, and cover coats can be applied by air or electrostatic atomization.

Adjusting ground coat slips

The adjustment of the ground coat presents the greater problem. Some of the slips have a tendency to drain extremely thin along sharp edges. This nullifies the decreased burn-off along edges characteristic of these enamels. The drain characteristics can be improved by blending frits, or by altering the mill formulation. These formulations are much the same as in current practice, although some suppliers have proprietary additions which they recommend. Pyro, potassium carbonate, and sodium aluminate are effective in adjusting slips without causing defects in the fired enamel.

Aging of slips need not be a problem. The use of borax instead of sodium nitrite in the mill usually stabilizes the set of ground coats for the duration of normal storage. The set of low-temperature enamels usually increases with age.

Fine grinding and wet spray

The application of the cover coats requires more attention than normally. Fine grinding and a wet spray give the most satisfactory finish. Tearing is not as serious as might be expected, the usual mill additions being effective if it does occur. A dry spray will produce an orange-peel which is difficult to fire out except by increasing firing temperatures.

The thickness of application is normal. Control is no problem. Existing procedures will suffice providing the higher densities of lead-bearing frits are taken into consideration.

Firing times were greatly extended for most of the early frits. This has been changed drastically, being reduced from as long as twelve minutes to as short as three minutes. Some enamels perform more satisfactorily if given a short intense fire than if given a longer lower fire.

In general, the mechanical problems presented by the slips will not limit the use of low temperature enamels where fired enamel properties are adequate. The utility and demand for the end product is highly dependent on the properties of the finish, and this is the area in which the greatest deviations from conventional enamels have occurred.

Appearance characteristics

In appearance, the enamels fired between 1200° F and 1350° F are nearly identical with conventional enamels. Reflectances in the 80's are not uncommon. Ample latitude for matching colors is available. The texture varies with the temperature, of course, in the customary manner. Most of these frits are titania-opacified.

The enamels fired below 1200° F tend to resemble organic finishes. A very fine type of orange peel is often present, but the finishes have a pleasing appearance. Reflectances are lower, and attempts to increase it by mill-added opacifiers results in a mat surface before normal requirements are met for white.

The 45° gloss does not seem to be a function of the firing temperatures. Table I shows a comparison between enamels with the same color. The low readings are usually gray ground coats to which stains have been added.

The lead-bearing frits usually have the highest values. The white enamels, if not overfired, have considerably more gloss than do conventional white enamels. High gloss readings were obtained even for enamels fired at 1000° F.

The problems of chipping and impact resistance seem to be little changed from conventional enamels. The stress is often less in the low-temperature enamels and this may reduce the frequency of occurrence somewhat, but not enough to justify any great change in handling precautions.

Acid and alkali resistance

These enamels are usually inferior to conventional enamels in one respect: chemical durability. AA acid resistant cover coats are available, but are limited in the applications to which they can be adapted. Most cover coats have B or C acid resistance. The ground coats usually have C or D.

A study was made of the alkali resistance of enamels by immersing 4″ x 4″ panels for six hours in either a 5% caustic or a 5% tetrasodium phrophosphate solution. Solution temperatures were varied from 140° F to 212° F. Results show considerably poorer resistance of the low-temperature enamels compared to conventional ones currently in use. The fact that the test curves are not parallel shows that the determination of alkali resistance in one temperature range does not necessarily

LOW TEMPERATURE CONTINUED

indicate the relative resistance in another range.

The lowest losses measured for the low temperature enamels tested to date are shown in Table 2. These values are not for individual enamels. The best that can be attained is a compromise between caustic and pyro losses. Almost without exception ground coats have better caustic than pyro resistance.

The affects of firing are the same for both the caustic and the pyro resistance. Underfiring lowers the resistance markedly, but overfiring lowers the resistance only slightly. If good chemical durability is important to the end use of the enamel the proper firing schedule must be determined and followed.

This study covered a total of 45 frits from six sources. The improvement in the quality of the frits during the last year has been beyond reasonable expectations. It is certain that, with this rate of improvement, enamels firing below 1350° F will soon become an important segment of our industry.

Adapted for MPM from a Paper presented at the 18th Annual Shop Practice Forum of the Porcelain Enamel Institute.

TABLE I

COMPARISON OF 45° GLOSS READINGS FOR VARIOUS ENAMELS

A	Brown		B	Turquoise Green	
	Enamel A	48		Enamel A	55
	" B*	64		" B*	67
	" C	53		" D	57
	Conventional	51		Conventional	55
C	Beige		D	Pink	
	Enamel A	55		Enamel H	62
	" D	73		Conventional	52
	" E	68		"	61
	" F	60			
	" G*	83			
E	White (1200-1350° F)		F	White (below 1200° F)	
	Eleven with an average of 67 and a range of 53 to 85**			Enamel J	73
				" K	68
	Conventional	58			
	"	59			
	"	58			

*Lead-bearing. **Non-lead-bearing.

TABLE II

THE LOWEST WEIGHT LOSSES FOR LOW TEMPERATURE ENAMELS TESTED IN CAUSTIC AND PYRO SOLUTIONS AT 212° F FOR SIX HOURS

	Caustic	Pyro
Ground Coats (1200-1350° F)	9 mg/in	14 mg/in
Ground Coats (below 1200° F)	33	80
Low reflectance cover coats (1200-1350° F) ...	48	5
Low reflectance cover coats (below 1200° F) ..	65	55
High reflectance cover coats (1200-1350° F) ..	162	31

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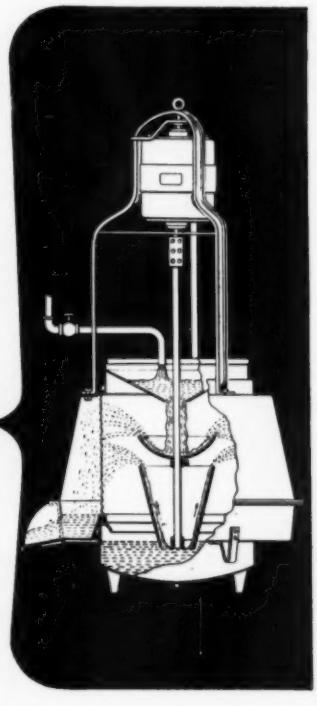

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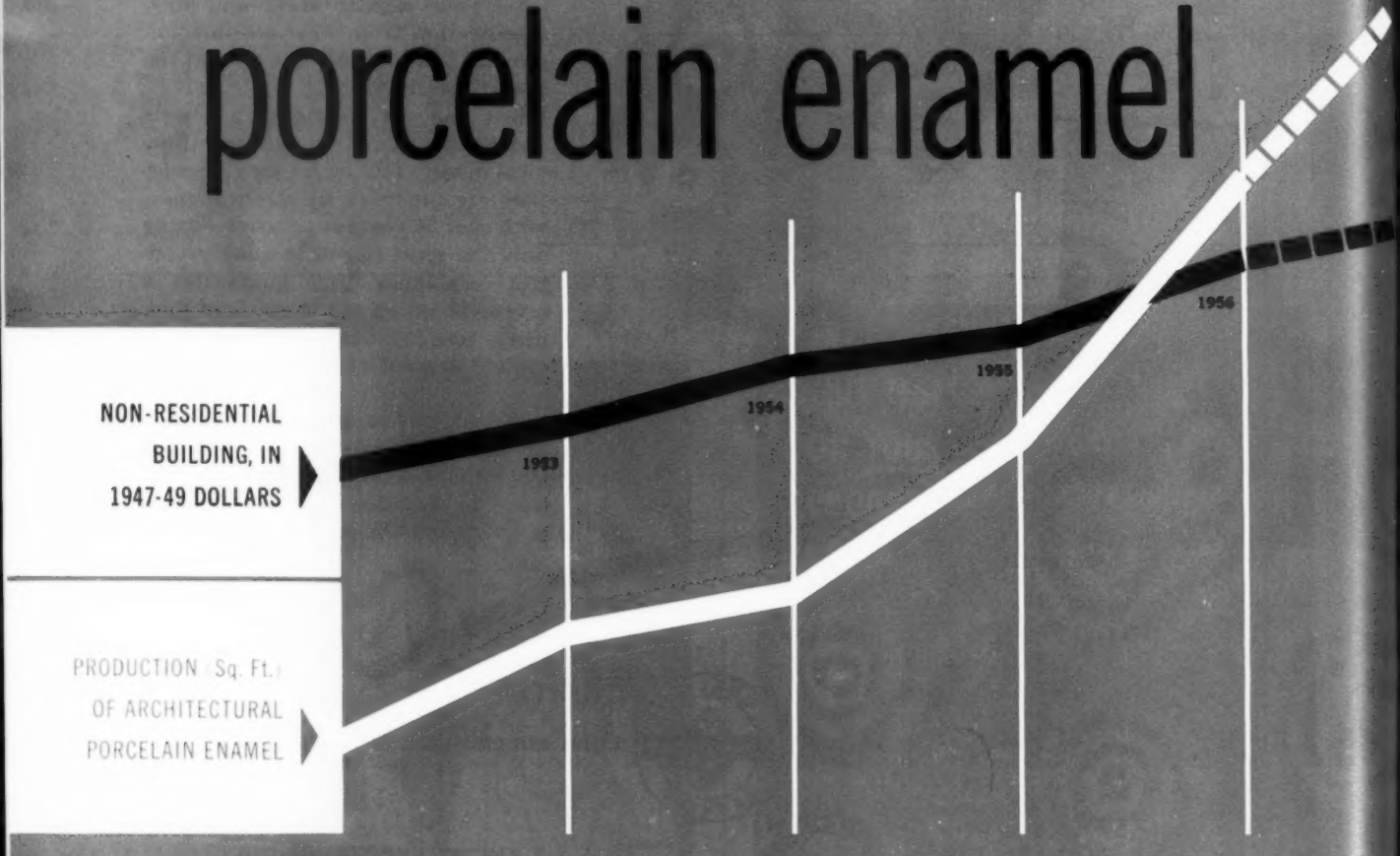
District Sales Offices in Principal Cities

Big things *are happening in* architectural porcelain enamel



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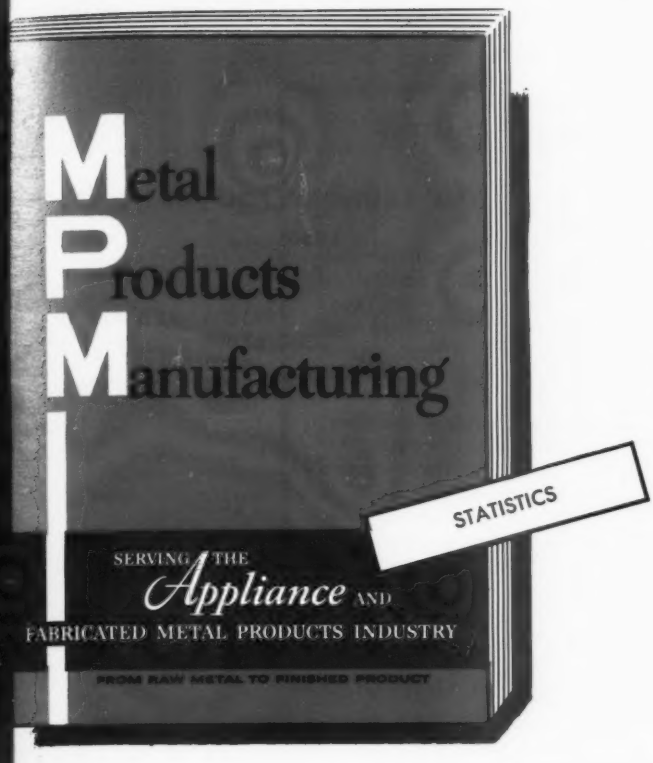
IN CANADA: FERRO ENAMELS (CANADA) LTD., OAKVILLE, ONT.

WORLD'S ONLY COMPLETE PORCELAIN ENAMELING SERVICE . . . including Plant Layout . . . Furnace Design and Construction . . . Product Design Assistance . . . Enamel Selection . . . Color Matching Service . . . Plant Start-Up Supervision . . . Production Trouble-Shooting . . . Cost Analysis Field Studies . . . Porcelain Enameling Materials and Supplies.



THE Fourth Annual MPM Market and Statistical Review reveals that the appliance and fabricated metal products industry is continuing to expand. 1955 was the biggest year in history and, despite declines for some products, the industry as a whole showed a further increase in 1956. Projections for 1957 indicate that, while some products have reached a temporary plateau, the industry is looking forward to an overall increase. Industry spokesmen are almost unanimous in agreeing that production and sales will continue to increase moderately through 1959, and that the early 1960's will see a spectacular increase due to the large increase in the formation of new families expected at that time.

Fourth annual market and statistical review of the appliance and fabricated metal products manufacturing field

SUMMARY — FACTORY SHIPMENTS AND/OR SALES

(Typical segments only — data not available for many groups)

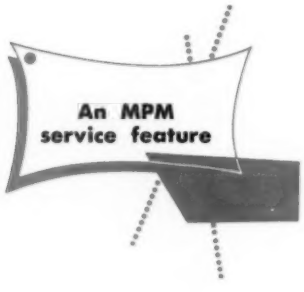
	Units Shipped			
Product	1953	1954	1955	1956
Air Conditioners, room	1,044,691	1,230,000	1,400,000	1,770,000
Electrical Appliances	64,367,300	62,234,000	70,750,000	79,942,000
Cooking & Heating Equipment (non electric)	9,975,369	8,967,606	9,930,542	9,570,988
Home Laundry Equipment (domestic only)	4,411,366	4,474,168	5,702,859	6,227,000
Plumbing Ware	5,561,193	5,841,017	6,594,644	6,001,302
Steel Containers	98,307,000	96,850,000	109,135,000	114,381,000
Steel Kitchen Cabinets	3,441,000	3,372,000	4,046,000	3,641,000
Vacuum Cleaners	2,777,756	2,658,136	3,270,441	3,721,870
TOTAL UNITS	189,885,675	185,626,927	210,829,486	225,255,160

ROOM AIR CONDITIONERS

(Units Sold)

	1954	1955	1956
Room Air-Conditioners ..	1,218,000	1,270,000	1,600,000
Central Air-Conditioning	12,000	130,000	170,000
Total	1,230,000	1,400,000	1,770,000
Estimated Retail Value .	$419,298,000	$412,000,000	$495,400,000

Source: Air-Conditioning and Refrigeration Institute
Retail value estimated by MPM.



HOME LAUNDRY EQUIPMENT

1956

Product	Units	Value
Domestic		
Washing Machines	4,530,000	$1,064,550,000
Ironing Machines	57,000	12,027,000
Dryers	1,640,000	360,800,000
Total	6,227,000	$1,437,377,000
Export totals unavailable		

1955

Product	Units	Value
Domestic		
Washing Machines	4,236,555	$ 997,678,503
Ironing Machines	81,910	17,283,010
Dryers	1,384,394	305,082,774
Total	5,702,859	$1,320,044,287
Export totals unavailable		

1954

Product	Units	Value
Domestic		
Washing Machines	3,490,212	$ 807,781,875
Ironing Machines	86,205	17,844,435
Dryers	897,751	209,290,171
Total	4,474,168	$1,034,916,481
Export totals unavailable		

Source: American Home Laundry Manufacturers' Assn.
Retail value estimated by MPM

ELECTRICAL APPLIANCE SALES

Product	1954 Units	1954 Retail Value	1955 Units	1955 Retail Value	1956 Units	1956 Retail Value
Coffee Makers	3,450,000	$ 68,674,500	3,675,000	$ 71,662,500	5,100,000	$ 98,685,000
Dehumidifiers	76,000	10,260,000	96,000	12,192,000	275,000	36,025,000
Dishwashers	215,000	64,500,000	295,000	90,270,000	400,000	116,000,000
Fans	6,735,000	251,116,500	5,585,000	203,392,000	6,590,000	246,501,000
Food Waste Disposers	400,000	47,980,000	520,000	59,800,000	590,000	64,900,000
Freezers	990,000	391,425,000	1,100,000	439,945,000	975,000	380,200,000
Heaters	1,330,000	34,232,500	3,360,000	100,227,000	3,622,000	104,248,000
Hotplates	710,000	5,928,500	950,000	7,362,500	760,000	6,042,000
Irons	6,583,300	95,062,300	7,930,000	112,871,000	8,715,000	122,743,500
Radios	6,276,000	188,787,400	7,665,000	244,609,600	9,200,000	293,100,000
Ranges	1,350,000	353,700,000	1,600,000	423,800,000	1,585,000	412,645,000
Refrigerators	3,600,000	1,095,865,000	4,200,000	1,323,000,000	3,700,000	1,202,500,000
Roasters	350,000	13,982,500	330,000	13,183,500	225,000	9,000,000
Television	7,346,700	1,689,741,000	7,756,500	1,745,212,000	7,200,000	1,368,000,000
Toasters	3,110,000	52,226,600	3,565,000	60,242,500	3,930,000	69,592,700
Waffle Irons	928,000	17,354,000	995,000	18,905,000	965,000	19,250,000
Water Heaters	800,000	101,337,500	900,000	103,500,000	870,000	100,050,000
Water Systems	728,000	123,400,000	788,000	130,000,000	775,000	120,125,000
Other Small Appliances* ..	17,256,000	383,771,700	19,440,000	419,841,200	23,875,000	421,744,000
Total	62,234,000	$4,989,345,000	70,750,500	$5,580,015,800	79,942,000	$5,191,351,200

***Including Blenders, Deep Fat Fryers, Floor Polishers, Food Mixers, Shavers, Broilers, Clocks.**
Source: Electrical Merchandising.

ESTIMATED SALES ELECTRIC APPLIANCES 1957

(Including Exports)

	% Increase	Unit Increase	Total Units Estimated 1957
Dehumidifiers	+09.1	25,000	300,000
Dishwashers	+18.7	75,000	475,000
Food Waste Disposers	+10.2	60,000	650,000
Farm and Home Freezers	+02.6	25,000	1,000,000
Ranges:			
Standard	No Change	No Change	1,200,000
Built Ins	+10.4	40,000	425,000
Total	+02.5	40,000	1,625,000
Refrigerators	+05.4	200,000	3,900,000
Storage Water Heaters	+03.4	30,000	900,000

Source: NEMA

COOKING AND HEATING EQUIPMENT—NON ELECTRIC

	1953		1954		1955		1956	
Product	Units Shipped	Value	Units Shipped	Value	Units Shipped	Value	Units Shipped	Value
Cooking Stoves and Ranges	2,385,983	$205,819,000	2,207,489	$182,743,700	2,440,338	$213,093,000	2,167,960	$195,024,000
Gas	2,097,462		1,967,113		2,216,943		1,961,600	
Bungalow & Combination Ranges	87,853		63,206		42,619		52,302	
Coal & Wood	83,062		67,897		70,317		61,463	
Kerosene	117,606		109,273		110,468		92,595	
Domestic Heating Stoves	3,278,473	84,649,000	2,278,661	61,002,400	2,415,013	69,097,000	2,514,218	71,278,000
Floor and Wall Furnaces	551,614	36,198,000	539,894	31,063,100	558,455	36,565,000	467,804	31,625,000
Water Heaters	2,183,000	114,607,500	2,281,100	119,757,800	2,596,636	140,956,000	2,665,957	143,852,000
Oil Burners	579,696	58,320,000	528,580	56,062,300	573,149	54,924,000	492,643	46,702,000
Residential	540,774		494,259		536,234		455,928	
Commercial & Industrial	38,922		34,321		36,915		36,715	
Warm Air Furnaces	996,603	197,275,000	1,131,882	205,895,200	1,346,951	255,592,000	1,262,406	241,519,000
Total	9,975,369	$696,868,500	8,967,606	$656,524,500	9,930,542	$770,227,000	9,570,988	$730,000,000

Source: Gas Appliance Manufacturers' Assn. and Facts for Industry.

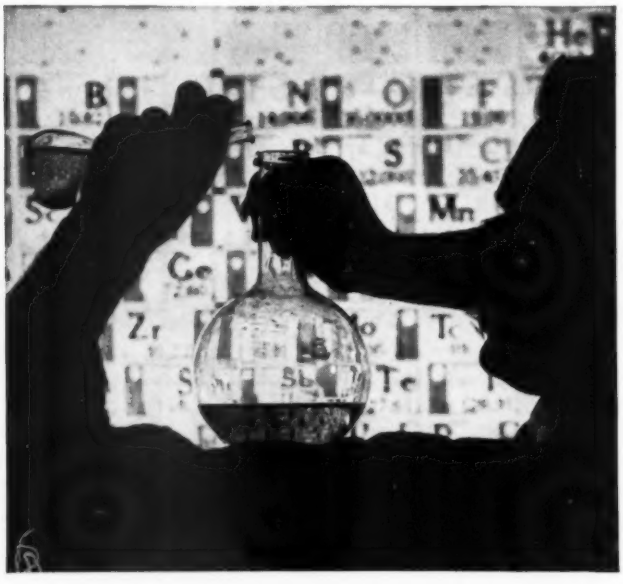
VACUUM CLEANERS

	1953		1954		1955		1956	
Product	Units	Estimated Retail Value	Units	Estimated Retail Value	Units	Estimated Retail Value	Units	Estimated Retail Value
Vacuum Cleaners	2,777,756	$262,277,000	2,658,136	$251,858,400	3,270,441	$307,421,454	3,721,870	$353,577,650

Source: Vacuum Cleaner Manufacturers' Assn. (Retail value estimated by MPM)

to Page 45 →

FROM VITRO —another example of research at work for you...



NEW PORCELAIN ENAMELS FOR ALUMINUM

These new Vitro finishes offer many important new advantages *plus* new production economies. They're available in a full range of colors and in four different types—either low in lead content or entirely lead-free—to meet any production needs. They can be applied easily and economically on wrought or cast aluminum at temperatures ranging from 800° to 1000°F, will give you any surface texture desired from high gloss to matte, and are highly resistant to weathering, sulfides, acids and alkalis.

From the standpoint of economy, you can't beat Vitro porcelain enamels for aluminum. Their initial cost is surprisingly low; and they provide high opacity whether used for one or two coat applications. Also, they fire very uniformly and are lightfast and extremely durable. Use them and you're sure to lower your production costs *and* improve the quality of your products.

If you would like additional details on these new Vitro enamels or samples for testing, write us today. There's no obligation.

Colors by Vitro

VITRO MANUFACTURING COMPANY • 60 Greenway Drive, Pittsburgh 4, Pa.

A Division of Vitro Corporation of America, West Coast Plant: 1625 West El Segundo Blvd., Compton, Cal.

PLUMBING FIXTURES

(Units Shipped)

Product	1951	1952	1953	1954	1955	1956
Lavatories						
Cast Iron	1,630,554	1,217,333	1,337,865	1,342,389	1,540,111	1,365,896
Steel	232,699	219,374	213,293	248,301	303,955	308,724
Total	1,863,253	1,436,707	1,551,158	1,590,690	1,844,066	1,674,620
Kitchen Sinks						
Cast Iron	1,212,586	1,000,835	1,022,101	1,008,873	1,060,086	921,358
Steel	1,196,859	1,015,328	1,096,584	1,169,121	1,363,971	1,318,076
Total	2,409,445	2,016,163	2,118,955	2,177,994	2,424,057	2,239,434
Bathtubs						
Cast Iron	1,504,471	1,355,181	1,434,881	1,507,786	1,678,467	1,485,503
Steel	413,477	454,500	456,199	564,547	648,054	601,745
Total	1,917,948	1,809,681	1,891,080	2,072,333	2,326,521	2,087,248

Source: Facts for Industry.

STEEL KITCHEN CABINETS

1956	
Units Sold	3,641,000
Retail Value	$188,395,000
1955	
Units Sold	4,046,000
Retail Value	$209,328,000
1954	
Units Sold	3,372,000
Retail Value	$174,440,000
1953	
Units Sold	3,441,000
Retail Value	$178,000,000

Source: Steel Kitchen Cabinet Manufacturers' Association.

STEEL CONTAINER ANNUAL SHIPMENTS

(Production For Sale)

(Does not include steel containers manufactured by companies for their own use)

	1950	1951	1952	1953	1954	1955	1956
19 Gauge & Heavier 13 Gallons & Larger	26,241,000	29,763,000	24,028,000	23,558,000	22,051,000	24,822,000	25,407,000
Lighter than 20 Gauge 12 Gallons & Larger	7,817,000	8,290,000	7,603,000	7,741,000	7,737,000	9,412,000	9,678,000
Heavier than 29 Gauge 12 Gallons & Smaller	66,129,000	73,681,000	61,286,000	67,008,000	67,062,000	74,901,000	79,296,000
Total	100,187,000	111,734,000	92,917,000	98,307,000	96,850,000	109,135,000	114,381,000

The steel container industry ranks second only to the automotive industry in the Nation's consumption of sheet steel.
Source: Steel Shipping Container Institute, Inc.

low temperature "hot spray" is employed for both electrostatic system and manual "touch up" in . . .

The organic finishing system at Curtis Lighting

by E. W. Harris • WORKS MANAGER, CURTIS LIGHTING, INC.

MPM PHOTOS

EXCLUSIVE • FEATURE

THE CRITICAL REQUIREMENTS, both for reflectance factor and permanence of color, that are so important in the manufacture of lighting fixtures, demand that the finishing operations, both in method and in material, be carefully controlled.

Curtis luminaires are produced in two different types of finishes: (1) those finished by the Alzak process, and (2) those requiring an organic finish. Production is split at about a 50-50 basis. All organic finished parts are fabricated from 0.036" cold rolled steel, utilizing conventional procedures.

Since, in the finished product, control of light is involved, the choice of finishing materials is limited to those which will provide satisfactory reflectance to give the highest requirements in "seeing" and at the same time afford pleasant appearance.

Moreover, since many times fixture installations are expanded, new rows of luminaires, added to existing installations in a ceiling area (that sometimes have been in operation for years previous), must afford a good color match.

This, of course, means that all products must have a finish which will have as nearly perfect color retention as possible and that the luminaires in use earlier will not have faded.

While Curtis has always attempted to provide this assurance of product by organic finishing, earlier methods were costly in relation to the system now installed. This is a part of a continuing program of providing equipment and processes to take advantage of the latest improvements in finishing techniques.

A thoroughly tested electrostatic spray operation provides the quality of work that the particular product demands, at the same time giving a lower per-unit cost.

The present layout includes a completely new 600-foot long overhead monorail conveyor system that carries the parts completely through cleaning, painting, and baking, and to the point of take-off for storage.

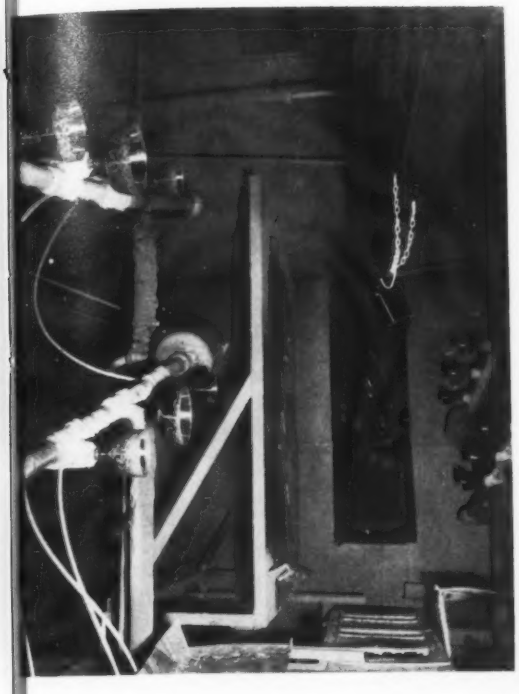
Parts are received from the fabricating section on skids or in boxes. According to the requirements of production, parts, in lots, are hung by means of "Christmas tree" fixtures (or by hooks in the case of larger parts) onto the monorail at the loading station.

Vapor degreasing used

From this station, the monorail conveyor carries the parts to the vapor degreaser which is located some 25 feet above floor level. Placement of the degreaser at the building ceiling level was done to minimize solvent vapor loss and to eliminate the possibility of fumes around work areas.

The work travels on the conveyor at a chain speed of 12 to 15 fpm. It is sent through the normal processes of vapor degreasing, using the spray process and vapor, where the dirts and oils

The first step in the fabrication of Curtis' luminaires is shearing the long strip from sheet stock; the second step, shown here, is cutting the strip to proper length for the part being produced.



Left: Electrostatic application of finish to both sides of the parts is done simultaneously in the operation. Here is shown the spray pattern of the electrostatic section. Parts being electrostatically finished are either hung in a stationary or rotating position, whichever lends itself best for the particular piece part. Guns in the foreground cover one side of part, and guns in the background coat the opposite side.

Right: Touch up of critical areas on irregular parts is done by manual spray to insure perfect coverage after the part has passed through the electrostatic spray section.

Below: Finished parts are inspected on the conveyor and parts which fail to pass inspection remain on conveyor to return for rework. Approved parts are removed from the conveyor, again inspected, and stacked on skids for storage or delivery to the assembly line.

MPM PHOTOS

picked up by the metal before and during fabrication are removed.

When the monorail system returns to ground level the parts are completely dry, as a result of air movement during travel, before they reach the electrostatic paint application section.

In the Curtis organic finishing system, two electrostatic spray booths are designed with applicators on both sides of the monorail path so that both sides of each part are painted consecutively.

Low temperature "hot spray"

The electrostatic system includes the hot spray method (low temperature) of application, with the paint being heated to 90 degrees F. at the heater. The paint temperature at point of application is in the 75 to 80 degrees F. range.

This inclusion of "hot spray" in the electrostatic system provides exact viscosity control and applies a uniform coating with greater film buildup.

After parts are coated, they travel on to two adjacent water wash booths. Here, less accessible areas of the parts are touched up to secure uniform coating on the irregular shapes.

Hot spray is used in this operation, too, with paint temperatures controlled to the same degrees as in the electrostatic section. The water wash booths are used solely to provide better working conditions. No attempt is made for paint recovery, since this is a relatively small volume operation dealing only with touch-up.

From touch-up, the parts travel free for about 20 feet of conveyor, providing for dry-off, before reaching the gas fired infra-red A type overhead oven. Each part receives a 4.5 to 5-minute bake in a 375-400 degrees F. atmosphere.

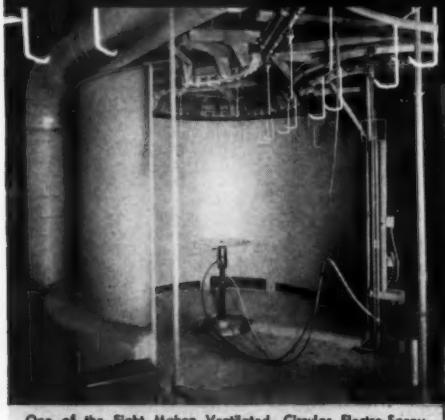
The system of exhausting and recirculation in this oven installation provides a total change of air in the oven every 4 minutes. A continuous recirculation system draws in fresh air and provides for heat mix without disrupting the temperature conditions of the oven.

After the parts are baked, they return to ground level on the monorail conveyor where they continue travel through "on conveyor" inspection and then to the unloading section. Here the parts are subjected to final inspection and palletized, then sent either to storage or to the assembly section.

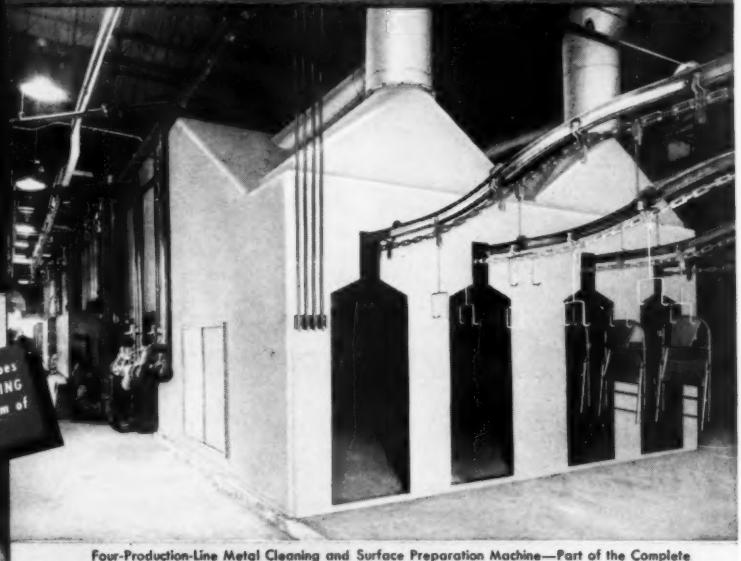
NEXT MONTH — Read about the modern facilities for ALZAK processing at Curtis Lighting.

COMPLETE *Finishing* SYSTEMS

. . . for ENAMELS • LACQUER • PAINT • VARNISH



One of the Eight Mahon Ventilated, Circular Electro-Spray Enclosures Employed in the Four Separate Painting Facilities in this System. Note Provisions for Control of Air Movement.



Four-Production-Line Metal Cleaning and Surface Preparation Machine—Part of the Complete Mahon Finishing System in the Durham Manufacturing Corporation's Plant, Muncie, Indiana.

One of the Four Separate Painting Units in this System. Each of the Four Production Lines Passes through an Identical Arrangement —Two Electro-Spray Enclosures and Staggered Touch-up Booth.

Ramp-Tunnel to Finish Baking Oven on Roof. Both Ramp and Oven Accommodate Four Parallel Conveyor Lines in One Straight-through Pass. Equipment is Divided with Two Lines on Each Side. Either Side can be Operated Independently.

Complete NEW FINISHING SYSTEM Provides FLEXIBILITY and Greatly Increased PEAK PRODUCTION CAPACITY!

A new and highly efficient Mahon Finishing System at Durham Manufacturing Corporation, Muncie, Indiana, gives management needed flexibility and greatly increased maximum painting production capacity. Four parallel painting production lines pass through the entire system. The Metal Cleaning and Surface Preparation Equipment, Dry-Off Oven, Cooling Tunnel and Finish Baking Oven are designed to accommodate four parallel conveyor lines. Each of the four conveyor production lines passes through one of four separate painting equipment arrangements—each of which includes two circular electro-spray enclosures and a staggered, touch-up Spray Booth. The entire System is designed so that two of the painting production lines can be shut down—the processing equipment is divided for this purpose. An ultramodern Finishing System of this type provides a manufacturer like Durham with painting equipment which will meet peak production demands and still permit operation at 50% capacity with the same efficiency and economy. If you are contemplating new finishing equipment, you, too, will want to discuss methods, equipment requirements and possible production layouts with Mahon engineers . . . you'll find them better qualified to advise you, and better qualified to do the all-important planning, engineering and coordinating of equipment. See Sweet's Plant Engineering File for information, or write for Catalogue A-657.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

SALES-ENGINEERING OFFICES in DETROIT, NEW YORK and CHICAGO

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems, Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

MAHON

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mass-produce

Distinctive Finishes

with

IC POLYFAX*
REPRODUCTIONS

the amazing process that ends styling limitations!

Philco's smart new 1957 Refrigerator sports a custom-styled finish that was applied on the *assembly-line* through IC Polyfax reproduction. Here's a finishing process that submits eagerly to the flair of designers—for it reproduces any subject matter that can be photographed. It's ideal for styling appliances, cabinetry, paneling, and a host of other products.

And in this highly specialized field, Interchemical is *the* expert. It calls for the highest skill in engraving printing cylinders and formulating the ground coats and inks to assure high fidelity reproductions hour after hour, day after day.

An Interchemical Technical Service Specialist will be glad to tell you how IC Polyfax opens up a whole new world of styling possibilities. Write for bulletin, "Polyfax—the Key to Distinctive Styling."

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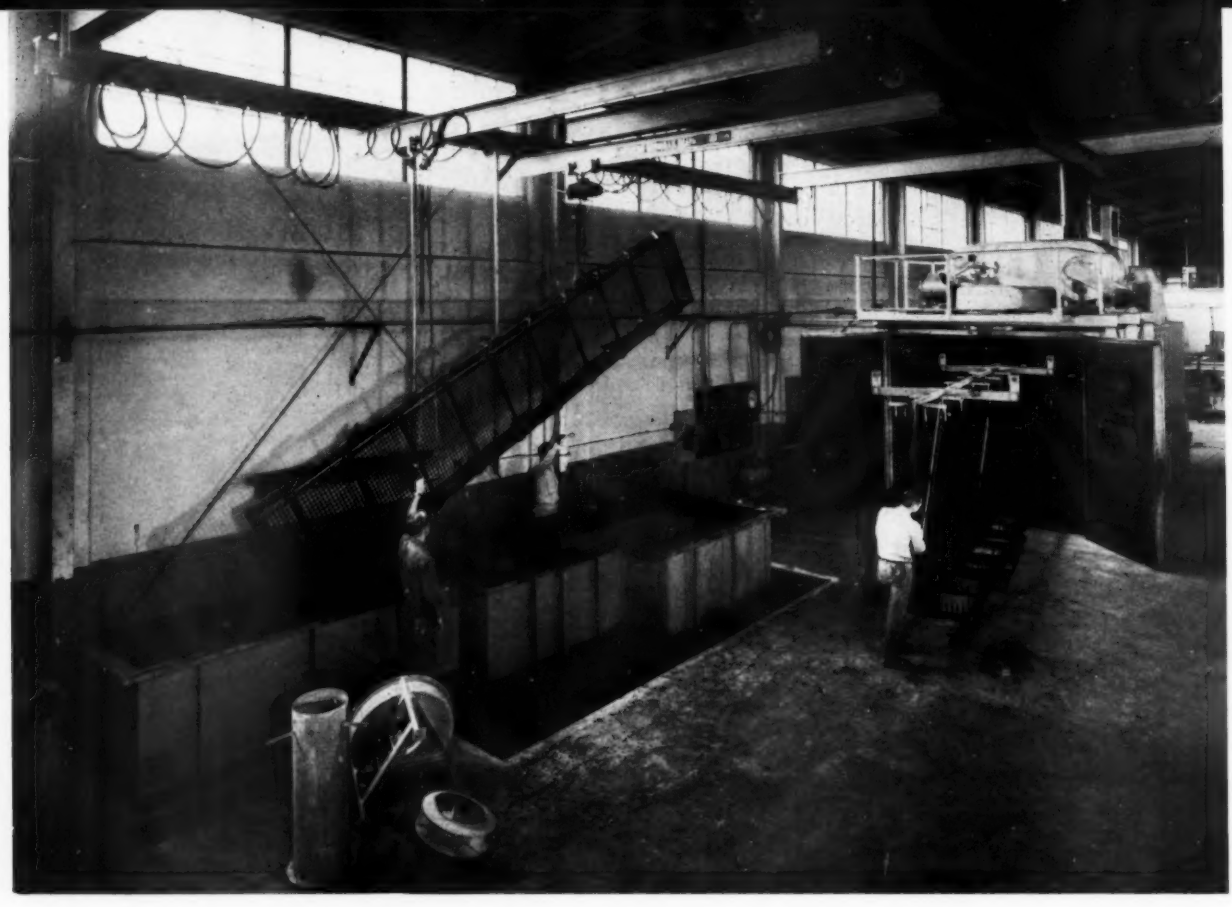


Plastisol coatings protect plant equipment

describing equipment and procedures employed by a Los Angeles firm in the application of these specialized coatings to industrial equipment

by Gilbert C. Close • WESTERN EDITOR

NOTHING can be said about the plastisol coating materials that will generate more interest among plant engineers and maintenance men than this simple statement of fact . . . they promise a knock-out punch to the age-old corrosion problems always associated with industrial plant processing equipment.

In addition, the plastisols promise to do the job at less cost, better, and more permanently than many of the older, less efficient techniques. The homogeneous, rubber-like surface of a plastisol coating is impervious to practically all industrial chemicals, has no seams or laps that may leak, is highly abrasion resistant, and provides superior insulation. As a bonus over and above providing protection for plant processing equipment, the plastisols are finding more and more uses on consumer products where maximum corrosion resistance, abrasion resistance, electrical insulation, and resistance to impact damage are important. In the home appliance and fabricated metal products industry, here are a few places where the plastisols are being used to advantage: (1) for the lining or overall coverage of all processing, solution, and plating tanks; (2) as a protective coating (and to provide the necessary insulation) on electro-plating work racks, baskets, and work holders; (3) for the work holders and baskets used in chemical processing and cleaning; (4) for coating the components of ventilating systems that handle corrosive gases; (5) to provide a resilient coating on metallic work handling equipment, thus avoiding impact damage, mars, scratches, etc.; and (6) for coating paddles, beaters, container interiors, and other mixer components for maximum abrasion resistance and increased wear.

In the consumer product category, the plastisols have proved effective as coatings on refrigerator, freezer, and dish washer racks. Here the normal resilient, rubber-like physical characteristics of the coating resists impact damage, won't oxidize and crack, and won't chip.

To get a sharp-etched impression of what is already being accomplished with plastisols, and a concrete idea of their latent possibilities, one has but to visit the processing shops at the Barber-Webb Company, Inc., Los Angeles, Calif., one of the nation's largest firms

dealing exclusively in the application of corrosion preventive coatings on all types of industrial products and equipment. In the past few months the company has installed more than $100,000 worth of equipment, designed specifically for the application of the plastisols. This equipment includes what is claimed to be the world's largest plastisol dip tank, with a capacity of 4000 gallons, and into which a part measuring 20 ft. by 6 ft. by 6 ft. may be dipped.

"Most of our work to date has been the coating of large pieces of processing equipment, including complete processing systems," a company official pointed out. "We tried to design the dip tank large enough to handle most such pieces without disassembly, but when a piece is too large to dip, the plastisol coating may be sprayed or applied by hand brushing."

Equipment for industrial work

The equipment at Barber-Webb Company, Inc., includes the large dip tank, along with a 6000 lb. capacity bridge crane for handling heavy work, several smaller dip tanks, a 25 ft. by 8 ft. by 8 ft. conveyorized oven, a 27 ft. by 12 ft. by 10 ft. batch oven, a 24 ft. by 7 ft. by 7 ft. batch oven, complete sandblasting facilities for precleaning the work, and the necessary spray guns, pressure tanks, etc., for spray applications of the plastisols on pieces too large to be dipped.

Heating units are provided where necessary so that the plastisols can be applied from warm to hot. Temperature of the metal at the time it is dipped is used also to control coating thickness. The higher the temperature of the metal at the time it is dipped, the greater the coating thickness, as the heat causes more of the liquid plastisol to polymerize and cling to the metal surface. The rapid polymerization of the plastisol on the metal being coated prevents runs and sags, even when very heavy coatings are applied.

When work is received at Barber-Webb, it is scheduled so that it can be handled "straight through," once the job is started. This is important because the work is first pre-cleaned by sandblasting, and application of the prime coating must follow quickly to avoid oxidation of the sandblasted surfaces. The prime coating is applied and cured at 350 degrees F. The part is then ready for the application of the plastisol.

For most pieces of processing equipment, coating thicknesses range in the neighborhood of ⅛-inch to minimize the possibilities of pinholes which would subsequently permit leakage of the processing solution through to the base metal. But if a pinhole does occur, it is easily detected by spark test, and the area is repaired by a localized hand application. All coatings applied at Barber-Webb are given this spark test as insurance against pinholed coatings.

Immediately after dipping, spraying, or brushing, the plastisol coatings are cured at 360 degrees F. The full depth of the coating itself, and the base metal on which it is applied, must reach this 360 degree F. temperature to assure complete polymerization.

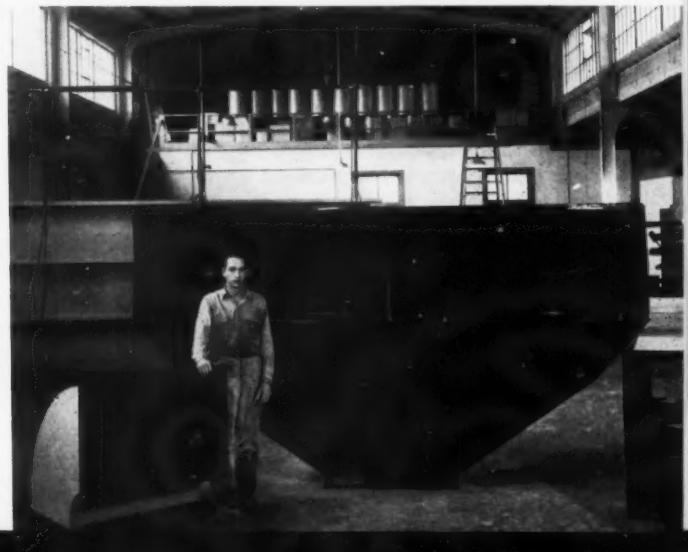
The plastisols are available in numerous colors, though black predominates when used as a protective coating on plant equipment. Conventional masking may be employed on areas where no coating is desired. In case of damage to an applied coating, the damaged area may be re-coated by a hand application, using a small torch to obtain the initial application temperature, then to cure the plastisol after it is applied.

Lined cone section of a processing tank.

Case histories indicate that plastisols pack the knock-out punch for a lot of plant equipment corrosion problems, especially where processing equipment is involved. They also forecast that the future will reveal many uses for these same plastisol characteristics on many types of consumer products.

NEXT MONTH — how Blackstone Corporation beat the corrosion problem.

Left: Inspecting plastisol coated acid baskets. Below: This 12'5" x 81" x 24" fume collector, coated in one piece, is part of fume duct system coated 100 per cent with plastisol finish. Top, opposite page: 1,000 gallon dip tank, overhead bridge cranes, and 27-foot oven at Barber-Webb Co., Inc., for dipping complete pieces of processing equipment.



safety, plant modernization, and stressed at the . . .

Pressed Metal Institute technical

by Dana Chase • EDITOR

REPRESENTATIVES of many of the country's leading metal stamping companies met at the Hotel Carter, Cleveland, Ohio, March 6, 7, and 8 for the annual spring technical meeting sponsored by the Pressed Metal Institute. Present also were representatives from Canada. The PMI technical sessions were planned by the Institute's Technical Research and Standards committee and Safety committee.

Safety and productivity

The morning session of Wednesday, March 6, was devoted to the subject of safety — so important in every stamping plant.

The management point of view was presented by Charles Cavano, partner, Employers Service Foundation, Cleveland; the designer's viewpoint by L. A. Faulkner, supervisor, Industrial Plant Service, Liberty Mutual Insurance Co., Boston; the worker's viewpoint by a panel for which Ben Small, personnel director, Morrison Steel Products, Inc., Buffalo, was moderator.

The "workers panel" included: Mr. Punch Press Operator — Michael Freddix, Variety Stamping Corp., Cleveland; Mr. Die Setter — Cass DiRoberto, Worcester Pressed Steel Co., Worcester, Mass.; Mr. Material Handler — James Farrell, Parish Pressed Steel Div., Dana Corporation, Reading, Pa.; and Mr. Maintenance Man — George Glass, Youngstown Kitchens Division, American Radiator & Standard Sanitary Corp., Salem, Ohio.

A. C. Davidson, Jr., Assistant Director Industrial Relations — Safety, American Steel & Wire Div., U. S. Steel, Cleveland, closed the morning safety meeting with an interesting, educational safety film produced for the A S & W division.

Awards to 19 companies

Following Wednesday's luncheon, James R. Oviatt, president, D. C. Oviatt Co., Cleveland, and chairman of PMI's safety committee, presented award plaques to representatives of the safety award winning stamping companies. Awards were for safety records during 1956, and companies were rated on their improvement in safety records over preceding years.

A total of 19 companies received the coveted safety awards. Award winners were divided into three classifications according to number of employees: to 75, 75 to 250, and 250 and up.

Questions and answers

An interesting question and answer session followed Wednesday's luncheon and award presentations. Subjects varied from methods for getting workers to use safety glasses, to press guarding equipment and safety educational programs.

Answers to the "safety glass" question included variations from salesmanship and psychology to compulsion. Many plants require the use of the glasses by both supervision and equipment operators. One representative suggested that a good selling program would get 90% acceptance, and that management "make" the remaining 10% use the glasses.

Opinion seemed representative that neither press guards nor safety education (individually) can be depended upon to prevent accidents. A combination of both, however, should result in good safety records.

Guard or stop equipment

A metal stamper from Canada reported that in his country a labor inspector checks equipment in stamping plants and "tags" equipment for shut down if it is not properly guarded .

The responsibility lies with the employer to place the operator on another job while the equipment is down, or pay him for down time.

Keep education "alive"

H. A. Daschner, PMI managing director, Ben Small, Morrison Products, and Cliff Boeckler, Niagara Machine & Tool Works, stressed the importance of changing banners, cards, and other in-plant safety educational and reminder material, both as to content and location, in order to receive full benefit.

Old, dirt-covered posters remaining in static locations, it was pointed out, are of little value.

A truly "moving" sign was described by Boeckler as having been applied (80 feet of it) to an overhead crane. Advice seemed to sum up to: quality, not quantity; avoid "static", use new locations; and try for original material.

Smoking and color coding

Many plants permit smoking in stamping plants, but the opinion was voiced that it is a dangerous practice for press and shear operators. A stamper from New Jersey reported that in his state, smoking on the job is prohibited.

Color coding of dies and equipment was suggested as a distinct aid to supervisors as a guide to the type of press protection equipment required for a specific job.

Air as a production and safety factor

Frank Engstrom, manager of Industrial Products Sales Department, A. Schrader's Son, Brooklyn, N.Y., traced the use of air valves from the first air inflated bicycle tire to current applications of air ejection and safety equipment through an interesting motion picture presentation.

It was demonstrated that compressed air can be a safety hazard of importance

and die maintenance were

Institute . . . . meeting

EXCLUSIVE MPM PHOTOS

At the speaker's table for the luncheon on Wednesday are: Above, Louis Laun, Bossert Div., Utica, N.Y.; Arthur Kelly, National Safety Council (Chicago); Benjamin Small, Morrison Steel Products, Buffalo, N.Y.; and James Oviatt, D. C. Oviatt Co., Cleveland, Ohio. Below: H. A. Daschner, PMI; Benjamin Pacek, Worcester Stamped Metal Co., Worcester, Mass.; Howard Nieberding, American Stamping, Cleveland, Ohio; Walter Proegler, Morrison Steel Products, Cleveland, Ohio; and Clifford Boeckler, Niagara Machine & Tool, Buffalo, N.Y.

At the speaker's table for the luncheon on Thursday are: Above, Russell Anger, Anger Mfg., Detroit, Michigan; Clint Styker, Maysteel Products, Milwaukee, Wis.; Bryant Gemmill, American Stamping, Cleveland, Ohio; and Bruce Krasberg, R. Krasberg & Sons Mfg., Chicago. Below: Dr. Laurence Hall (featured speaker); H. A. Daschner, PMI, Cleveland, Ohio; Darwin Clay, Parish Pressed Steel Div., Dana Corp., Reading, Pa.; and Robert Barth, Barth Corp., Cleveland, Ohio.

if not properly controlled, both as to equipment and the human element.

Materials handling = 35 per cent

In discussing "Flexibility of materials handling in the job stamping plant", Robert Brady, W. B. McClelland Co., Cleveland, made the statement that 35 per cent of industrial accidents are in materials handling. Back injuries and hernia predominate.

Brady referred to materials handling in its broadest sense, in that he classed practically all movement of material, except the actual press stroke, in the MH category.

In Brady's opinion, too much MH equipment is purchased without first determining just how it is to be used. Fork trucks, cranes, etc., do not represent materials handling — they are only the "aids".

When "kickers" attempt to block logical plant improvement, this speaker suggests 4 questions: 1) What do you consider the problem to be?, 2) the cause, 3) the possible solution, and 4) what solution do you suggest?

Brady's "9 guideposts for materials handling" are constructive and, space permitting, will be presented in a later issue of MPM.

New England speaks on modernizing equipment

One of the sessions which developed strong interest among the stampers was a morning panel discussion on Thursday on the subject of modernizing existing equipment.

Carl Johnson (moderator), chief engineer, Larson Tool and Stamping Co., Attleboro, Mass.; Walter Gulliksen, vice president and general manager, Waterbury Mfg. Co., division of Chase Brass and Copper Co., Waterbury, Conn.; and Vincent Hendricks, The Pneumatic Applications Co., Simsbury, Conn., presented a weight of evidence pointing to the practicality of modernizing existing equipment for increased production in stamping plants. Many case histories were shown pictorially to demonstrate how old presses can be modernized for greater safety, increased production, and in some cases, to get automatic operation.

Mr. Johnson selected two of several reasons for modern stamping plants to use old or "antiquated" machinery.

We quote: "*The first reason* to consider is the cost or capital expenditure angle. The smaller stamping plants naturally have much less capital to work with than the larger plants; and of course there is no comparison with the "Captive Plants" that are owned by large corporations. Since most of us fall in the small or average size plant category, we just cannot afford to buy new machinery beyond our means; and

to Page 56 →

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LOOK AT YOUR PRODUCT from the woman's angle. Sales success depends upon her acceptance. She wants a product that will keep its good looks—that is easy to clean and keep clean—that resists rust and corrosion—that doesn't tarnish—that is tough and strong to resist denting and scratching.

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NOW LOOK AT YOUR PRODUCT from the production angle. You and your suppliers can fabricate ENDURO Stainless Steel on your present equipment without difficulty or major change in procedure. And remember, ENDURO requires *no* lacquering, plating or electro-chemical treatments to enhance its famed corrosion resistance and lasting beauty. Republic Metallurgists will help you choose the proper ENDURO types to add sales stimulus to your product. Mail the coupon.

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Company_____
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These men are representative of the 19 who received safety awards at the PMI meeting. They are: Morrison, Morrison Products; Mueller, Luitink Mfg.; Bryte, Sheet Metal Specialty Div., (Follansbee); O'Brien, Banner Stamping; Kessler, Kickhaefer; McCullough, Budd Co.; and Pacek, Worcester Pressed Steel.

P. M. I. → *from Page 53*

we are forced to resort to "Modernizing our Existing Equipment" by the law of economics.

"*The second reason* applies to all sizes of plants, whether they have large or small pocketbooks. This reason is the time element involved in waiting for new equipment (such as a transfer type press). If a job must be started at once, there is no time to wait for delivery of a new press. One must consider using what machinery is available, either in one's own plant or on the used machinery market. The available equipment may not be just what we would like to have, but by using a little ingenuity we can make improvements by adding standard eqlipment that can be attached, or that can replace antiquated and undesirable parts of the machines in question. Sometimes our own tool room can make the changes and improvements without the need of purchasing any special gadgets or attachments."

Mr. Hendricks gave graphic examples of how air friction clutches can be used on power presses to increase production and reduce costs. One of many examples covered a case where production of laminations on a fly wheel press automatically, after converting to air clutch, increased from 3 to 5 times over former output.

He cited a large automotive company that increased production by over 18 per cent on a series of existing presses with air clutch conversions. Over $1 million was spent to convert.

Controls are *very* important to air clutch operation, Hendricks stated. The converted operation can be no better than the controls installed.

Mr. Van Deusen made it quite clear that, in his opinion, plant improvements such as modernizing old equipment, or purchasing new presses, could only be substantiated by one principal reason — the Profit Factor.

A. The press itself — 1) Rebuild for better operation and increased production; 2) Revise — change a hand operated machine into an automatic; 3) Add new features—clutches, variable speeds, controls; and 4) New devices — automatic feeds, checking and inspection stations, ejection systems.

B. Change in product design may be of equal or even greater importance.

C. Integration of operations — plant layout, machine placement, materials handling, etc.

D. Automatic handling of parts between operations.

To sum up his case for the importance of product design, Van Deusen cited a company that purchased new equipment which resulted in a cost reduction on a high production component from 16¢ to 9¢ each. This was fine, but the designers then changed the part so that cost again went back to 16¢ in spite of plant modernization.

Another case history this speaker cited showed where four bench-type presses (and operators) were released to a single piece of equipment and one operator — a pay-off for ingenuity.

The effective method, said Van Deusen, is to combine modernization, design engineering, and new equipment planning into a sound integrated program.

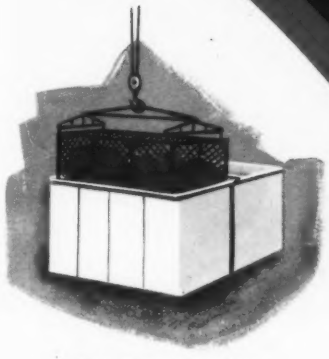
Winners of PMI's 1956 Safety Awards

Sheet Metal Specialty Div., Follansbee Steel Corp., Follansbee, W. Va.
Suburban Metalcraft, Inc., Des Plaines, Ill.
Steel Fabricating & Engineering Co., Chicago, Ill.
The Leake Stamping Co., Monroe, Mich.
The Boehm Pressed Steel Co., Cleveland, Ohio
HPL Manufacturing Co., Cleveland, Ohio
Freeway Washer & Stamping Co., Cleveland, Ohio
Indiana Pressed Steel Co., Inc., Muncie, Ind.
Kickhaefer Mfg. Co., Milwaukee, Wis.
Luitink Mfg. Co., Milwaukee, Wis.
Manufacturers Service, Inc., Cleveland, Ohio
Morrison Products, Inc., Cleveland, Ohio
Telmore Tool & Engineering Co., Chicago, Ill.
The Toledo Pressed Steel Co., Toledo, Ohio
Udall & Landan Mfg. Co., Inc., New York, N. Y.
Admiral Tool & Mfg. Co., Chicago, Ill.
Banner Die Tool & Stamping Co., Chicago, Ill.
The Budd Co., Philadelphia, Pa.
Worcester Pressed Steel Co., Worcester, Mass.

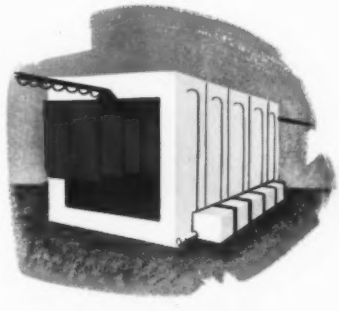
Checking fixtures

William E. Hoffman, associate editor, *Tooling and Production magazine*, Cleveland, gave a scholarly presentation of the importance of using gages and checking fixtures in connection with tooling for production, and for quality control. Hoffman displayed samples on gages and checking fixtures supplied by metal stamping plants, and deplored what appeared to be (based on a plant survey) a lack of interest in their use by the stamping plants. *to Page 80* →

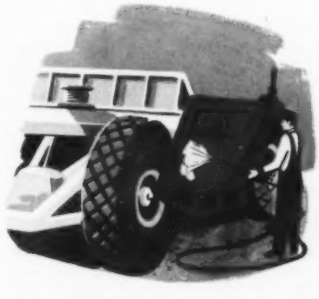
New England was well represented in this speaker's panel consisting of Carl Johnson, Larson Tool & Stamping Co., (moderator); Walter Gulliksen, Waterbury Mfg. Co.; Vincent Hendricks, Pneumatic Applications Co.; and Neil Van Deusen, V. & O. Press Co.



By Immersion



By Spray Washing



By Steam Cleaning

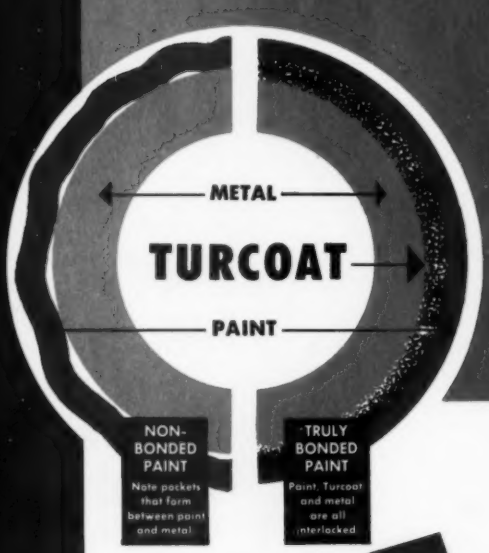
A Better Bond...

For Organic Finishes

TURCO

TURCOAT MATERIALS

What is TURCOATING?



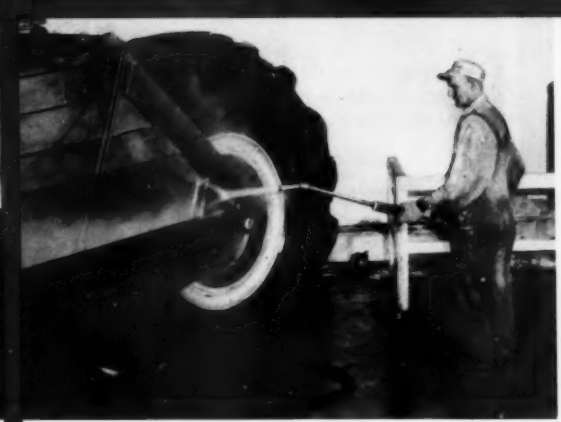
You will be assured of a PERMANENT PAINT SEAL, simply by using the recommended Turcoat material as a bond for organic finishing.

Turcoating is a process which puts a chemical coating on metals. The coating consists of a complex growth of non-metallic crystals, soft and porous, yet firmly adherent to the surface. Most of the Turcoat materials are phosphate compounds. The outstanding advantage of Turcoat materials is in the function they perform so well of holding paint or other organic coatings closely bonded to metal surfaces. The Turcoat coating, interlocked with the surface, makes a combination that wards off moisture, chemical fumes, air, local electric currents, friction... all the conditions that contribute to breakdown and corrosion of metals.

1 BY SPRAY WASHING—For continuous production line phosphating or localized touch application of a Turcoat material by spray washer is ideal.

2 BY IMMERSION—Many small parts of a variety of sizes and shapes can be phosphated simultaneously when a Turcoat material is applied by immersion.

3 BY STEAM CLEANING—Parts too large to phosphate by other methods may be Turcoated by use of a steam cleaning machine.



TURCO TURCOAT 7 FINER MATERIALS

AS A BOND FOR PAINT

Turcoat materials slightly etch metal surfaces and deposit a toothy paint-gripping coating. Paint is anchored **uniformly**, even on sharp edges and points. There are no thick beads at lower edges... no popping off of paint, due to corrosion "creep back" under the paint from abrasions. Turcoat preparation results in **better appearance** and life of paint for the customer... in **fewer rejects** for the factory.

		TURCOAT MATERIAL	TYPE OF COATING
1	SIMULTANEOUS CLEANING AND LIGHT PHOSPHATING OF METALS—A superior cleaner for light soils; produces light, very smooth phosphate coating; assures paint adhesion; prevents rapid re-rusting of steel before painting.	TURCOAT 4185	Phosphate of the metal to which applied; e.g., iron phosphate, aluminum phosphate, zinc phosphate.
2	PROTECTS ALUMINUM AGAINST CORROSION AND ASSURES PAINT ADHESION—Provides aluminum with a chrome-type chemical film or coating of the surface conversion type.	TURCOAT 4178	Amorphous aluminum and chromium compounds.
3	AS A BOND FOR PAINT—Smooth, tight phosphate coating as a bond for paint; also for metal drawing.	TURCOAT 3540	Zinc phosphate.
4	ANTI-FRICTION COATING AND FOUNDATION FOR OIL OR PAINT—Substantial phosphate coating for moving parts; rustproofing of small parts to be oiled in mass production; foundation for oil or paint.	TURCOAT 3557	Manganese, zinc and iron phosphates.
5	SIMULTANEOUS CLEANING, CONDITIONING AND PHOSPHATING OF METALS—A superior cleaner for light soils; removes light rust blotches; produces light phosphate coating; assures paint adhesion.	TURCOAT 3979	Phosphate of the metal to which applied; e.g., iron phosphate, zinc phosphate, aluminum phosphate.
6	SIMULTANEOUS CLEANING AND PHOSPHATING OF METALS—Especially hot dip galvanized surfaces.	TURCOAT 3979-3540	Mingled phosphates of zinc and metal applied on.
7	Chemical coating as bond for paint.	TURCOAT 3560	Oxalate type.

AS A BOND FOR OTHER ORGANIC FINISHES

Turcoat materials are vital in mass production of small parts, such as nuts, bolts, clips, etc. Such parts are difficult to paint, due to clogging of threads and small openings, sticking together of pieces, non-uniformity and general messiness. A Turcoat material, applied by tumbling on such parts, provides a substantial surface structure which will absorb and hold corrosion preventive oils or other organic protective materials.

ANTI-FRICTION COATING

Turcoat materials form an anti-friction cushion between moving parts, thus protecting fine metal surfaces from galling. They are also very useful in break-in of new machinery. When used in conjunction with special lubes, Turcoat materials are of great benefit in metal drawing. They protect both the product and the dies from injury by gouging and breakage, thus saving expense as well as lost production time.

PROTECT METAL FROM CORROSION

Turcoat materials will protect your product during storage, shipment, and between shop operations. All pass the most rigid salt spray tests. For the many fabricators of aluminum, one of the materials (Turcoat 4179) has been designed not only to prevent the corrosion of aluminum and to provide better paint adhesion, but also to impart a special beauty which lends itself to use for ornamentation.

RECOMMENDED USES	GOVERNMENT SPECIFICATIONS	METHOD OF APPLICATION AND EQUIPMENT	METALS AND COATING WEIGHT
On any steel components: such as cabinets, heaters, structural parts, awnings, venetian blinds, etc. Ideal for use through a steam cleaner on road graders, farm machinery, etc.	Meets salt spray and paint adhesion requirements of: JAN-C-490, Grade I MIL-C-490A, Grade I USA-57-0-2C, Type II, Class C	Spray: 3-5 stage spray washer. Dip: 3-5 tank system. Steam cleaning machine.	Iron, steel, aluminum, zinc. Up to 70 mg/sq. ft. (on steel).
On any aluminum components: such as aircraft parts, structural building parts, household appliances, truck, coach, and housetrailer bodies, aluminum sheets, bins and partitions, ornamental aluminum, etc.	MIL-C-5541	Spray: 4 stage washer. Dip: 4 or 5 tank system. Hand Methods: Brush, swab, flow on, roll on, etc.	Aluminum and its alloys.
On any fabricated parts: such as auto body parts, sheet metal components, refrigerator, heater and washing machine parts, projectiles, bombs, mines, metal drawings, etc.	MIL-C-490A, Grade I USA-57-0-2C, Type II Class C MIL-S-5002	Spray: 5 stage washer with drier. Dip: 5 tank system.	Iron, steel, zinc, cadmium. Up to 400 mg/sq. ft.
Pistons, gears, crankshafts, ordnance parts, clips, bolts, nuts, fasteners, tools, compressor shafts, lubrication boxes, etc.	MIL-C-12968 (ORD), Type B USA-57-0-2C, Type II Classes A, B and C MIL-C-490A, Grade I JAN-C-490, Grade I	Dip (including tumbling): 5 tank system.	Iron, steel, cadmium. Up to 3000 mg/sq. ft.
On any sheet steel components: such as cabinets, heaters, structural parts, aluminum awnings, venetian blinds, etc.	Meets salt spray and paint adhesion requirements of: JAN-C-490, Grade I MIL-C-490A, Grade I USA-57-0-2C, Type II Class C	Spray: 3-5 stage spray washer. Dip: 3-5 tank system. Steam cleaning machine.	Iron, steel, aluminum, zinc. Up to 100 mg/sq. ft. (on steel).
On any sheet metal components: such as fabricated parts, cabinets, heaters, coolers, etc.—especially those having galvanized surfaces.	Meets salt spray and paint adhesion requirements of: JAN-C-490, Grade I MIL-C-490A, Grade I USA-57-0-2C, Type II Class C	Spray: 3 stage spray washer. Dip: 3 tank system.	Iron, steel, zinc, aluminum. Up to 200 mg/sq. ft.
On any terne plate or tin surface, such as in the manufacture of caskets, soda fountains, refrigerated display cases, ammunition boxes, etc.	None applicable	Spray: 2 stage washer with drier. Dip: 2 tank system with drier.	Terne plate, tin. Up to 500 mg/sq. ft.

EASY TO USE

Turcoat materials always assure trouble-free operation. They cause only slight sludging and scaling of a non-troublesome nature. Thus, clean-up is no problem. All Turcoat coatings become non-smearing immediately upon processing. Parts can be handled freely while still wet without danger of streaking or smearing coating. Turcoat materials are free from objectionable odors or dangerous fumes.

EASY TO CONTROL

Turcoat materials do not require frequent tinkering with corrective agents or the resultant interruptions in production. Titrations are simpler. There is a greater latitude in temperatures and solution strengths. Minor deviations will not throw the processes out of kilter. Turcoat materials eliminate the need for constant complicated controls.

. . . AND, PRIOR TO PHOSPHATING

In addition to the actual coating materials described below, the complete Turcoat line includes a group of crystal-refining pre-phosphate compounds which are a new concept in the metal-working field. These materials assure improved, more compact, even smoother coatings. Included in this group are:

1. Turcoat Activator—when used after pickling, or when pre-cleaning is not necessary, this compound conditions metals to accept a very smooth, tight, uniform coating.

2. Turcoat Cleaners—each compound in this line is specifically engineered for pre-cleaning prior to Turcoating. Compatible with Turcoats, these pre-cleaners drastically improve effectiveness of coatings.

OPERATION CYCLE

SPRAY *(3 stage washer)*:*
Stage 1—Turcoat 4185, 1-2 oz/gal; 140-180° F.
Stage 2—Turcoat 4185, 1-2½ oz/gal; 140-180° F.
Stage 3—Turcoat 4185 rinse, 1/10 oz/gal; 160-180° F.

DIP *(3 tank system—agitated tanks)*:*
Tank 1—Turcoat 4185, 2-4 oz/gal; 180-190° F.
Tank 2—Turcoat 4185, 4 oz/gal; 180-190° F.
Tank 3—Turcoat 4185 rinse; 1/10 oz/gal; 180-190° F.

STEAM CLEANER*—Turcoat 4185, 6 oz/gal in reservoir; ½ oz/ gal at nozzle.

**Consult Technical Data Bulletins A-108-12 & A-108-13 for 4 and 5 stage or tank systems and for steam cleaner use.*

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1. PRE-CLEANING—Dip: Turco Aviation, Turco 4090, Turco 4215 or Turco Alumiclean, 6-8 oz/gal; 170-180° F.
Spray: Turco Sprayzall or Turco 4215, ½-2 oz/gal, 150-180° F.
2. RINSE—Hot.
3. DEOXIDIZING—(if required): Turco 2897, 10 oz/gal; 75-85° F.
4. RINSE—Cold.
5. TURCOATING—Dip: Turcoat 4178, 1-1½ oz/gal; 80-100° F; 3-5 minutes.
Spray: Turcoat 4178, 1-1½ oz/gal; 90-100° F; 1-2 minutes.
6. RINSE—Cold or lukewarm.

SPRAY:
Stage 1—Clean: Turcoat #1 Cleaner, ⅛-2 oz/gal; 140-165° F.
Stage 2—Rinse: Hot.
Stage 3—Turcoat 3540, 1-3 gal/100 gal water. Room temperature to 160° F; 1 minute.
Stage 4—Rinse: Cool.
Stage 5—Chromic acid, rinse: ½ lb/100 gal water; 180° F.

DIP
Tank 1—Clean: Turcoat #1 Cleaner, 2-6 oz/gal; 170-190° F.
Tank 2—Rinse: Hot.
Tank 3—Turcoat 3540, 2-3 gal/100 gal water; 160-175° F; 2-10 minutes.
Tank 4—Rinse: Cool.
Tank 5—Chromic acid rinse: ½ lb/100 gal water; 180° F.

TANK 1—Clean: Turcoat #1 Cleaner, 2-6 oz/gal; 170-190° F.
TANK 2—Rinse: Hot.
***TANK 3**—Turcoat 3557, 6-7 gal/100 gal water; 15-30 minutes; 200-210° F for rust proofing.
TANK 4—Rinse: Cool.
TANK 5—Chromic acid rinse: ½ lb/100 gal water; 180° F.

**For paint foundation use, see special instructions in Technical Data Bulletin A-108-4.*

SPRAY *(3 stage washer)*:*
Stage 1—Turcoat 3979, 1-2 oz/gal; 140-180° F.
Stage 2—Turcoat 3979, 1-2½ oz/gal; 140-180° F.
Stage 3—Chromic acid rinse: ½ lb/100 gal water; 170-180° F.

DIP *(3 tank system—agitated tanks)*:*
Tank 1—Turcoat 3979, 2-4 oz/gal; 180-190° F.
Tank 2—Turcoat 3979, 4 oz/gal; 180° F.
Tank 3—Chromic acid rinse: ½ lb/100 gal water; 170-180° F.

STEAM CLEANER*—Turcoat 3979, 6 oz/gal in reservoir; ½ oz/gal at nozzle.

**Consult Technical Data Bulletins A-108-10 & A-108-11 for 4 and 5 stage or tank systems and for steam cleaner use.*

SPRAY *(3 stage washer):*
Stage 1—Turcoat 3979, 2 oz/gal; Turcoat 3540, 1 gal/100 gal water, 150-160° F.
Stage 2—Turcoat 3979, 2 oz/gal; Turcoat 3540, 1 gal/100 gal water, 150-160° F.
Stage 3—Chromic acid rinse: ½ lb/100 gal water, 160-170° F.

DIP *(3 tank system):*
Tank 1—Turcoat 3979, 2 oz/gal; Turcoat 3540, 1 gal/100 gal water; 160-175° F.
Tank 2—Turcoat 3979, 2 oz/gal; Turcoat 3540, 1 gal/100 gal water; 160-175° F.
Tank 3—Chromic acid rinse: ½ lb/100 gal water; 170-180° F.

STAGE 1 OR TANK 1—Turcoat 3560, 12½ lb/100 gal water; 160° F. Use air agitation when dipping. Pre-cleaning may not be necessary.
STAGE 2 OR TANK 2—Water rinse (warm or cold).

WHICH TURCO OFFICE IS NEAREST TO YOU?

YOU NEEDED OR HELP—
CALL OR WRITE

Contact Turco if you have any special inspection or cleaning problems or need any technical information

TURCO PRODUCTS INC.

Chemical Processing Compounds

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Manufactured in Canada by B. W. Deane & Co., Montreal

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Peoria, Illinois, First National Bank Bldg.	6-1521
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13th International heating and air-conditioning exposition big success

THE 13th biennial International Heating and Air-Conditioning Exposition held at the International Amphitheatre, Chicago, from February 25th through March 1st, broke all records and was according to all reports a huge success. The exposition had an all-time high of 500 displays and an attendance for the week of an estimated record total of nearly 30,000.

The exposition was sponsored by the American Society of Heating and Air-Conditioning Engineers whose 63rd annual meeting was held concurrently at the Conrad Hilton Hotel. John W. James, of Chicago, is president of the Society.

James pointed out: "This year's exposition has attracted more exhibitors than ever before. Our space requirements were 15 per cent greater than any of the past. Not only are many exhibitors using larger spaces than at previous expositions but there is an influx of companies which have not shown here before as well as concerns new to the industry.

"This reflects the expansion of the heating and air-conditioning industry in residential, institutional and industrial fields. Heating, ventilating and air-conditioning have become an integral part of the construction industry and the growth rate does not give any signs of leveling off."

Exposition considered success

Exposition manager, E. K. Stevens said: "The exposition was not open to the general public and admission was by invitation or registration only. It would be difficult to assess sales during the exposition but we do know that commitments for equipment, large and small, came from many sources — engineers, architects, heating and air-conditioning contractors and dealers. In addition to those 'shoppers', professional men who return biennially for refresher courses in design and for information on new developments, were attracted."

MPM received nothing but enthusiastic reports on the exposition. Each exhibitor questioned by the MPM editor in attendance reported that the traffic had been heavy, the caliber of the men stopping in their exhibits was good, and in general that they considered the exposition very successful.

Wide variety of equipment was on display

Every kind of equipment employed in stabilizing indoor weather or acclimating industry was on display. Many products were on view for the first time, others had been newly redesigned. Exhibits ranged in magnitude from the tiny thermistor that senses and signals changes in the weather out of doors, to a big "climate changer", built to heat or cool as many as 25 zones within a building.

Engineering trends, by comparison with former expositions, reflected improved styling, more diversified methods of clarifying air, greater reliance on changes in the weather to modulate air-conditioning, improvements in automatic control of devices and integrated systems, as well as a general effort to suppress the sounds that are generally associated with air moving apparatus.

Room coolers have undergone many changes and were shown in improved conventional as well as under-the-window and also through-the-wall designs. Several such units show very little projection into the room; one only 2 inches.

to Page 80 →

How to solder stainless steel

knowing how to prepare the metal, select the solder, make the best joint, and "finish" the job, can eliminate the "costly misunderstandings"

by G. W. Hinkle • STAINLESS METALLURGICAL ENGINEER, REPUBLIC STEEL CORPORATION

DESPITE its "silver" appearance, there's "gold" in stainless steel for sheet metal work as applications increase for this corrosion-resistant metal. But according to Republic Steel Corporation, too much of the profits from stainless steel work have already been devoured by mistakes in soldering the metal — mistakes that the producer hopes to prevent by launching a "how-to-solder-stainless" campaign.

As a result of field service reports of "costly misunderstandings" of the facts about working with stainless steel, a simple step-by-step procedure for getting the best results from soldering has been outlined.

In using the term, "costly misunderstandings," it should be explained that the cost has been in the money and material wasted when improper soldering produces weak joints, poor finishes, and damage to the stainless steel itself.

The main point is that the sheet metal worker will find it just as easy to solder stainless steel correctly. The rewards for doing the job right include such points as minimum maintenance over years of service, maximum "cleanability," and long-lasting attractiveness in the stainless steel work.

The major causes for trouble noted in the reports have been improper or sloppy cleaning of the work before and after soldering, selection of the wrong flux, and use of the wrong type of joint for the job.

In place of these practices, here are the four steps given by our engineers for fabricating sound, attractive, and durable bonds in stainless steel sheets.

1. Preparation of the surface

The first step calls for proper preparation of the surface of the sheets to be soldered. Successful soldering of any metal depends on how well the solder adheres to the surfaces. Grease and dirt prevent the solder from making a firm bond with the stainless steel surface, so cleaning is important. Cleaning with solvent, or a weak alkaline solution, is the recommended process before soldering.

Preliminary roughening of the surface also helps to make a stronger soldered joint by increasing the adhesion of the solder. For this purpose, emory cloth or paper is used.

Poor adhesion of the solder is traceable in most cases to the flux used. Republic Steel cautions that satisfactory results can be expected only from the fluxes made especially for stainless steel.

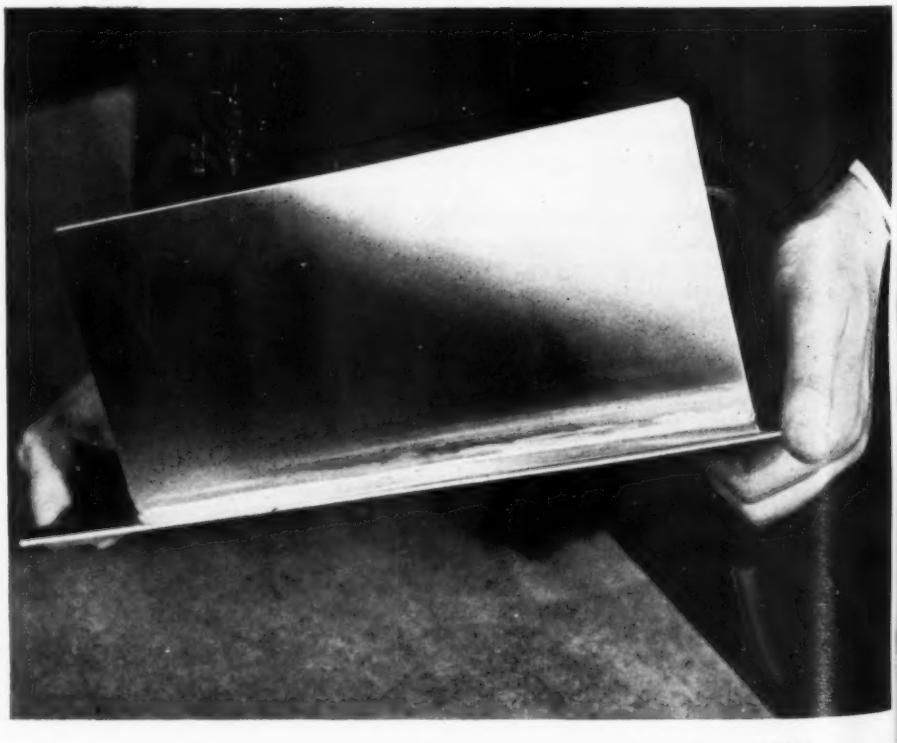
The hard surface of cold rolled stainless strip may be too smooth for good adhesion when joints are made with 50-50 solder applied with an ordinary soldering copper.

To overcome this difficulty, add one teaspoonful of glycerine to a cup of the commercial stainless soldering flux. This gives the flux enough surface tension to wet the surface thoroughly. The joint may then be soldered in the regular manner for stainless steel.

2. Selection of the solder

Although three types of solder are ordinarily used by metal workers, the most popular for stainless steel jobs is 50-50, containing equal amounts of tin and lead. This type flows smoothly and adheres to stainless for strong joints.

But for stronger joints that require greater resistance to corrosion, the other two solders, 60-40 and block tin, are recommended Popular usage gives the preference to block tin in most cases.



The finished joint, after proper soldering technique is employed, looks like this.

It is also important to use a large soldering copper when joining stainless steel. It should be heated just above the melting point of the solder. The heat conductivity of stainless is lower than that of most non-ferrous metals. The extra heat from the large copper encourages flow of the solder fully throughout the joint.

This flow can be assisted if the sheet metal worker holds his copper on top or bottom of the lap instead of at the edge of the seam. By cutting his speed he also causes all parts of the joint to be more thoroughly heated.

3. Making the best joint

Since stainless steel is a relatively stiff material, it exceeds the strength of the solder bond by many times. This explains why soldered joints of the softer materials can be deformed without rupture, while the same joint made in stainless may open up.

This is also the reason that it is always preferable to use solder only for a seal on a stainless steel joint. The joint itself should be designed for mechanical strength by double seaming, riveting, spot welding, or by some similar method.

All types of joints formed in a sheet metal shop can be made on stainless steel.

The plain or lap joint is recommended for use where it is not stressed to any great extent. The design of the part being fabricated determines this. When a plain or lap joint is used, the edges should be roughened, tinned and then sweated together. Spot welding at regular intervals gives additional mechanical strength. The joint is then sealed with solder, using cut acid or stainless steel flux.

If appearance is not of prime importance, riveting may be used to give strength to stainless steel joints. This is followed by a soldered seal. However, the appearance of the rivet heads along the joint may be objectionable.

Other types of joints, lock seaming, plain or flush, key lock, standing end, side folded end, or inside lock, can be readily made on light gages of stainless. Preferred procedure calls for tinning all edges before bending, sweating together, and adding solder where needed.

Butt joints must often be used to join stainless steel. For these jobs the use of the strapped butt is recommended. This also holds well for mitered corners. The strap should be spot welded to the sheets, and gussets spot welded to the mitered joints for best results.

When spot welding equipment is not available, a fairly good joint can be made by using straps and gussets sweated to the stainless without reinforcement.

It's just as easy to solder stainless steel correctly, and it pays off with better results. Here are some illustrations of the recommended procedure for the soldering operation:

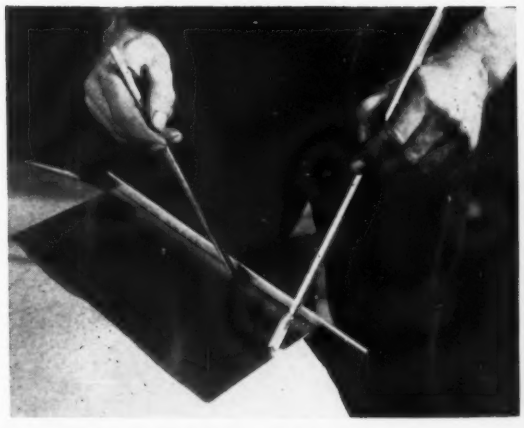
1. — Applying the flux;

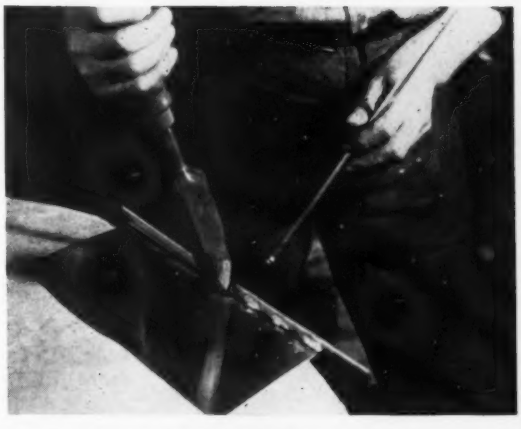
2. — Tacking;

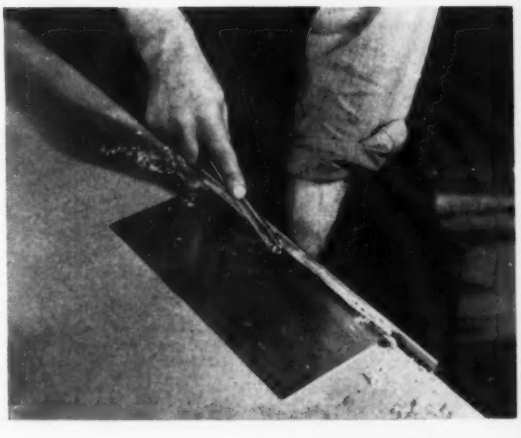
3. — Applying solder;

4. — Removing excess;

PHOTOS COURTESY REPUBLIC STEEL CORP.







4. Finishing the job

Once the joint is completed, one more step remains before the job is finished. The seam should be scraped of excess solder and all flux removed from the surface.

Stainless steel fluxes are usually highly corrosive and should be neutralized as quickly as possible after the joints are made. Neutralizing is accomplished by washing the entire part, particularly the joint, with a washing soda (sodium carbonate) solution of five to ten per cent concentration. Wash with a soft rag, or immerse the part completely in the solution, if possible.

The important thing is that neutralizing should never be overlooked. Republic Steel puts this warning in capital letters to emphasize that the forgotten flux may damage the stainless steel permanently, and ruin an otherwise perfect metalworking job.

Since the solder itself is comparatively soft, excess solder can be scraped off — but only with a stainless steel tool. This precaution is also necessary since particles from a carbon steel tool may become imbedded in the stainless during scraping. These would soon rust and discolor the area touched by the tool.

The final effort calls for rinsing the surface with clear warm water. The water spots in turn may be removed with Bon Ami or fine whiting. The result is an attractive and sound joint that matches the quality of the stainless on which it is made.

AHLMA to stimulate industry thinking for the future

by B. J. Hank • *PRESIDENT, AMERICAN HOME LAUNDRY MANUFACTURERS' ASSOCIATION*

THE 41st Annual Meeting of the American Home Laundry Manufacturers' Association, to be held at the French Lick - Sheraton Hotel, French Lick, Ind., April 14-16, will be devoted to "Imagineering Toward 1965!"

At this meeting, leaders of the industry, suppliers and friends will gather to project their ideas into the next decade—on design, materials, components, and compounds! No idea is too silly; anyone may build on another person's thoughts. Collectively, as a group, the industry will mentally construct 1965's washer, dryer, combination washer-dryer, and ironer. In fact, the industry might also construct a few futuristic laundry appliances that haven't even occurred to many of us as yet.

We believe that this "brainstorming" approach will be doubly valuable to the industry. First, we think it will be immediately beneficial to all of us in our long-range thinking and planning for the future. Secondly, everyone who participates will be better prepared for developments within the industry which we may expect to see appear by 1965.

The real growth lies ahead

We firmly believe that the real growth of the home laundry appliance industry still lies ahead. We are living today in a dynamic age of engineering advancement, research and exploration . . . an age unparalleled in our nation's history. Spending on research is running at the rate of $5 billion a year, as compared with less than $900 million in 1941.

Engineers and researchers are now perfecting hundreds of exciting new products in laboratories all across the country. We have been assured that many of these future products will be available in the very near future. I am personally convinced that home laundry appliances will not be overlooked.

Products yet to come will represent 11 per cent of '59 sales

Recently we read a report that manufacturers expect 11 per cent of their 1959 sales to be in products not now on the market. In an industry such as ours, where we have tripled the number of home laundry products available in the 10 year period from 1939 to 1953 (discounting four war years of non-productivity), this is not surprising. Therefore, many of the imagineering ideas that will be presented at AHLMA's Annual Meeting might well be considered a "sneak preview" of what lies ahead.

In my judgment, it will be a great privilege to attend this meeting. Those men and women who do participate will be gaining a great and valuable advantage of Association membership!

If you doubt the value or need of this kind of meeting, just look back to what we offered in home laundry appliances at the end of World War II, and compare that with where we are today, or consider for a moment the corporation which recently announced that 80 per cent of its sales today were of products *not in existence* ten years ago. The home laundry industry is not too far from that now!

FORTY-FIRST ANNUAL MEETING
of the
AMERICAN HOME LAUNDRY MANUFACTURERS' ASSOCIATION
French Lick-Sheraton Hotel
French Lick, Indiana
April 14-16, 1957
IMAGINEERING TOWARD 1965

SUNDAY, APRIL 14

2:00 P.M.
REGISTRATION

5:30-7:00 P.M.
PRESIDENT'S RECEPTION

MONDAY, APRIL 15
9:45 A.M.

CALL TO ORDER
B. J. Hank (Conlon-Moore), AHLMA President

IMAGINEERING MODERATOR
Jack D. Lee (Westinghouse)

IMAGINEERING HOME LAUNDRY DESIGN — 1965
Martin Bartling, Treasurer, Bartling Construction Company & National Association of Home Builders
Joseph R. Mango, Banka-Mango, Industrial Designer

IMAGINEERING MATERIALS — 1965
Aluminum — John R. Willard (Aluminum Co. of Amer.)
Plastics — T. A. DeMarco (Monsanto Chem. Co.)
Porcelain Enamel — Donald R. Goetchius (Ferro Corp.)
Paints & Enamels — Tom Armel (Glidden Co.)
Steel — W. B. Nixon (Armco Steel Corp.)

PRESIDENT B. J. HANK

IMAGINEERING COMPONENTS AND FEATURES — 1965
A demonstration by Pierce Sperry (Sperry Rubber) and John A. Kovas (Dole Valve)

IMAGINEERING WASHING PRODUCTS — 1965
Elaine Knowles Weaver (Ohio State Univ.)
Betty B. Olson (General Electric)
George Allen (Whirlpool-Seeger)

LUNCHEON — 12:30 P.M.–2:30 P.M.
Speaker to be selected

EVALUATION & OPEN FORUM DISCUSSION
In which the audience and all of the above speakers will take part as well as the following Chairmen and Vice Chairmen

DESIGN
F. H. McCormick (Frigidaire), Chm.
G. L. Ogdin (Robertshaw), V. Chm.

MATERIALS
W. B. Nixon (Armco), Chm.

COMPONENTS
J. A. Kovas (Dole Valve), Chm.
Pierce Sperry (Sperry), V. Chm.

COMPOUNDS
C. H. Fuchs (Westinghouse), Chm.
R. E. Hauber (Procter & Gamble), V. Chm.

6:30 P.M.
RECEPTION AND INFORMAL PARTY

TUESDAY, APRIL 16
9:30 A.M.
Board of Directors Meeting

10:00 A.M.
Joint Committee Meeting (Eng. & Res. Com. and Parts & Service Com.)
Other committee meetings to be announced

LUNCHEON — 12:15 P.M.
AHLMA's ANNUAL MEETING OF MEMBERS
B. J. Hank (Conlon-Moore), Presiding

THE EXECUTIVE DIRECTOR'S REPORT
Guenther Baumgart

THE TREASURER'S REPORT
G. M. Sheehan (General Electric)

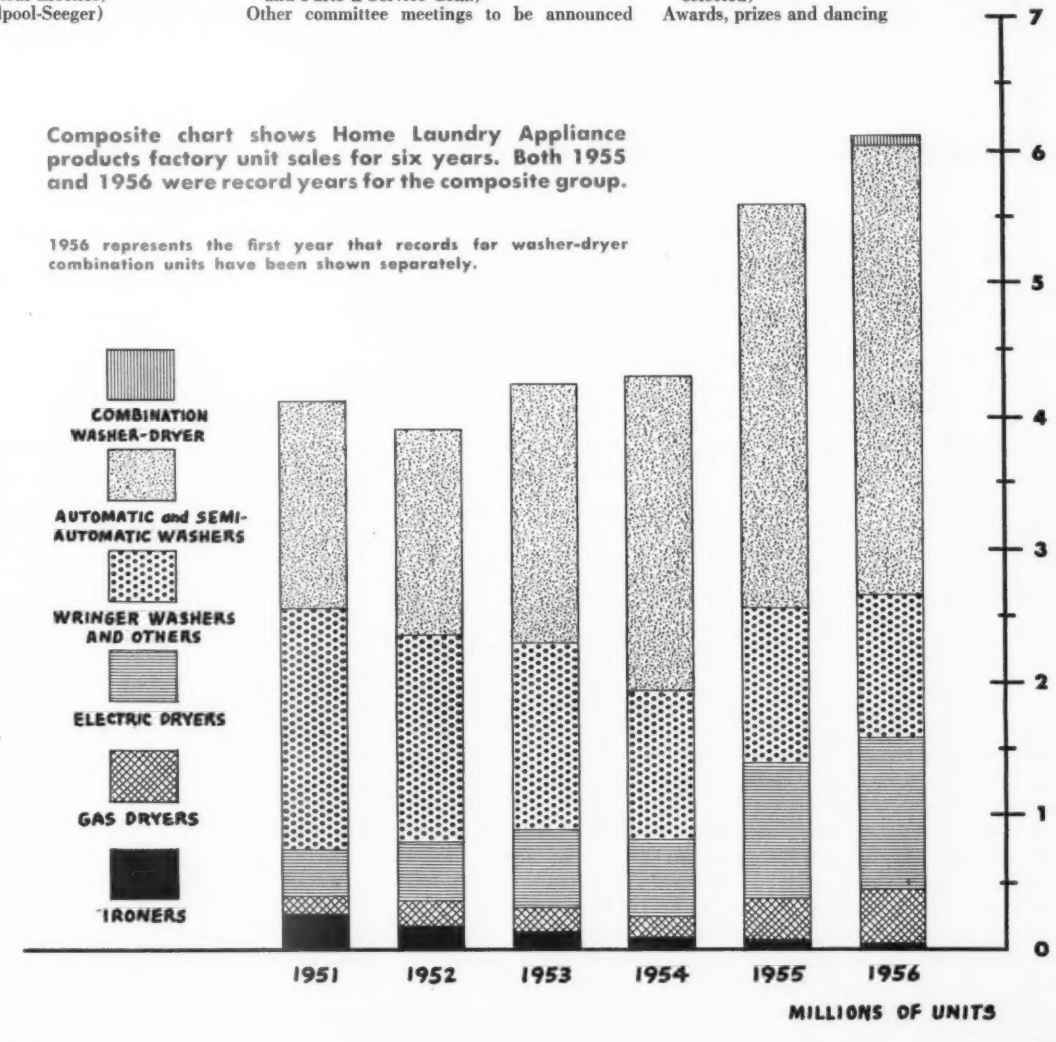
THE PRESIDENT'S REPORT
B. J. Hank (Conlon-Moore)
Election of honorary members
In memoriam
Other business

A SURVEY OF OUR 1957 STATUS IN WASHINGTON
George P. Lamb (AHLMA's General Counsel)

2:30 P.M.
Recreation & Golf Tournament

6:30 P.M.
Formal Reception

7:30 P.M.
FORMAL DINNER
Richard E. Krafve, Vice Pres., Ford Motor Co. Gen. Mgr., Edsel Div. (topic to be selected)
Awards, prizes and dancing



DIE CAST zinc refrigerator parts, after nickel plating, are being rinsed in preparation for the final chrome plate at Lee Silver Service, Inc.

CHROMIUM PLATED die cast washing machine control panel is about to enter a final, deionized water rinse at the Precision Casting company plant.

The electroplating of zinc die castings

rolled and die cast zinc, in its various basic designs and complex shapes, is taken through the electroplating process in this article

by Ernest Horvick • AMERICAN ZINC INSTITUTE, INC.

MPM EXCLUSIVE FEATURE

Although zinc die castings are quite corrosion resistant, they are often nickel and chromium plated both for decorative purposes and for severe service conditions where added protection is needed.

Rolled zinc and zinc die castings, because of their specific chemical characteristics, cannot be plated with nickel in the baths and under the conditions commonly used with other metals. Since the use of copper as a primary coating has become common, however, the same copper, nickel and chromium solutions used with other metals can be used without modification with zinc. While most of the common basic metals may be plated satisfactorily in the same solutions, zinc, like each of the other metals offers its own individual requirements in the steps preceding plating.

Polishing and buffing

Articles formed from rolled zinc or die cast from zinc alloys usually require surface preparation prior to plating, in order to produce the luster desired in the final plate. Removal of parting fins and stub gates from die castings by use of specially constructed trimming dies is followed by polishing with setup wheels. These wheels vary in type in commercial practice, depending upon the requirements of a particular job. Sections of glued buffs sewed together are common but many platers use felt, sheepskin, and other types of wheels.

Both artificial and natural emery are widely used and usually set up on the wheel face with water soluble glue. Emery sizes vary widely in commercial practice, but the 180- to 220-mesh range is preferred for the final stage of polishing where parting lines only are being polished. In some cases where the entire surface is being polished the final emery size will be from 200 to 320-mesh. The last stage of polishing is usually carried out with a lubricant on the wheel.

Wheel diameters range from 8″ to 14″ in commercial practice, with an outstanding preference for the 14″ size. Wheel speeds should not exceed 8000 surface feet per minute. Many plants prefer speeds around 4000 surface feet per minute.

Importance of pre-work

It is obvious that the amount of work done on the casting before plating will, to a large extent, govern its appearance when finished. Rolled zinc normally requires only buffing and coloring to prepare it for plating.

Polishing with abrasive belts is fairly

common practice. An ingenious arrangement reported in the literature uses a buffing wheel in place of a pulley. The wheel deforms sufficiently to permit ready polishing of rounded surfaces.

Light polishing and satin finishing also may be accomplished by two other methods. In one the work is tumbled in barrels using a mixture of abrasive and wood chips with a suitably dry lubricant. By using a sequence of abrasive sizes, die castings can be freed of fine fins and brought to a suitable degree of surface perfection to permit plating. A final buffing operation may be needed.

Processing of complex shapes

Where the parts are somewhat complex in shape and contain cored holes in the significant surfaces, greaseless compounds may be used to advantage with flexible wheels. This reduces the limitations imposed by the comparative rigidity of set-up wheels. A wide choice of compounds is available permitting production of satin finish surfaces suitable for plating. Since the cutting speed of greaseless compounds and the surface quality produced are influenced by both the speed and the type of wheel the suppliers of compounds should be consulted.

Where a high final luster is desired buffing and coloring are required. Buffing or cutting down is best done with tripoli on cloth wheels. These vary in stitching pattern and in hardness, depending upon the shape of the piece being handled. In general, the number of stitches and hence the hardness of the wheel is increased as the surface to be buffed approaches a flat surface.

It is essential in the case of zinc that the tripoli used be free cutting, since excess pressure results in dragging and waviness particularly in the case of rolled zinc. Buffing wheel speeds should not exceed about 8500 surface feet per minute for die castings or about 5500 surface feet per minute for rolled zinc. Speeds around 4000 surface feet per minute are increasingly common. The r.p.m. to give these surface speeds with various wheel diameters follow.

In the preparation of rolled zinc, higher speeds have a tendency to cause dragging, warping and waviness. In the case of die castings this factor, while important, usually is not critical. The effect of high wheel speeds is to increase the temperature which in turn may alter the binder in the buffing compound in a manner which causes increased cleaning difficulties.

CHROMIUM PLATED zinc cast part, the base of a popular food blender, is carefully packed at Precision Casting Co., Kalamazoo plant.

Buffing compound selection

Consideration should be given in the selection of buffing compounds to the compatibility of the compound binder with the cleaning system which is to follow. The use of a binder not readily removable in the cleaning operation greatly complicates the problem of obtaining satisfactory plated coatings.

Satisfactory coloring can be accomplished with the cloth wheels using a dry, soft compound. The compound should be dry and free from lime, since excess grease makes cleaning difficult and the presence of lime makes both cleaning and rinsing harder to accomplish successfully. In many cases in commercial practice no coloring compound is used but a portion of the face of the buffing wheel is left free of buffing compound and the work is given a dry wipe on this part of the wheel. Combination cut and color compounds are used to some extent to produce a luster intermediate between those obtained by a straight cutting down operation and by a coloring operation.

Suggested cleaning methods

Plated coatings applied to uncleaned or poorly cleaned zinc surfaces will be found to be poorly adherent. The surface must be free from grease, dirt and reaction products from the cleaner if satisfactory adhesion is to be attained. Reaction with the cleaner must be avoided particularly when the work is to be plated with copper.

Simple electrolytic alkaline cleaning is not entirely satisfactory for zinc die cast-

to Page 70 →

Diameter of Wheels-Inches	R.P.M. to Give 4,000 Ft./Min.	5,500 Ft./Min.	8,500 Ft./Min.
4	3,800	5,250	8,100
6	2,550	3,500	5,400
8	1,900	2,600	4,000
10	1,550	2,100	3,250
12	1,250	1,750	2,700
14	1,100	1,500	2,300
16	960	1,300	2,000
18	850	1,165	1,800

ings because of the danger of overcleaning some areas while removing heavier grease films from other areas. Frequently the heat developed during buffing, particularly in automatic set-ups, will cake the compound trapped in recesses into a hard mass which must be softened by other means before electrolytic cleaning can be effective. Some form of solvent treatment is desirable as a preliminary step. Trichlorethylene is widely used for this purpose. In addition to the hazards attending their use, kerosene and gasoline deposit heavy hydrocarbon residues during evaporation which are not easily removed by alkaline cleaners. Heavy and caked grease films can be softened and largely removed in various available proprietary water emulsion type precleaners.

Use your supplier's knowledge

It is urged that the reader consult the suppliers of equipment and solvents for detailed instructions in their use. Serious plating trouble due to faulty operation of degreaser units has been observed in the field. It may also be pointed out in connection with the use of solvents that unless vapor rinsing is used, the last traces of solvent to dry will leave a residue. Even when vapor rinsing is used, it is strongly urged that an alkaline cleaner and an acid dip follow the solvent treatment. When properly conducted, this procedure will insure the removal of remaining dirt and grease films and of any oxides, etc. which may be present.

The selection of an alkaline cleaning procedure should be approached with care. It has now been established with certainty that the formation of blisters in copper deposits on zinc die castings can result from excessive alkaline cleaning. Poor adhesion due to faulty cleaning has been shown to produce inferior service performance.

Selection of cleaning cycles

The selection of a cleaning cycle will depend to a considerable extent upon the type of equipment available. A short cycle suitable for hand operation in still tanks will not be satisfactory in a slowly moving conveyor unit where the cleaning time is frequently measured in minutes. There are available on the market today a number of excellent proprietary cleaners specifically designed for use on zinc.

These should be used in accordance with the instructions of the manufacturer. For those who prefer a simple non-proprietary cleaner, the cathodic use of a solution of 4 to 6 ounces per gallon of trisodium phosphate (30 to 45 grams per liter.) is suggested. This solution like all alkaline cleaners is used at a temperature of about 180°F.

It is common commercial practice to operate alkaline cleaners as electrocleaners. In the past, the work was made cathodic; however, most platers today use anodic cleaners.

Cleaning time a factor

It is not possible to give definite preferred cleaning times, since this factor will vary with the type and amount of grease, the type and concentration of the cleaner, etc. In general, however, relatively strong cleaners should not be operated cathodically with strong evolution of gas for times exceeding 15 seconds. For conveyor operation when the work has been completely degreased, simple immersion cleaning is often sufficient. It is necessary that the plater work out the permissible time for his operation by test. In doing this, care should be taken to avoid developing a practice which permits serious overcleaning. Overcleaning is not always detectable by a change in surface appearance. If good adherence is not obtained in a reasonable cleaning time, the cleaner is at fault and extension of this time aggravates the trouble.

It is quite important that the last trace of alkaline materials be removed from zinc surfaces before plating. This is best accomplished by alternate rinsing in hot and cold water, followed, of course, by a suitable acid dip. The use of a hot water rinse is urged strongly as it avoids the possibility of entraining alkaline reaction products which are less soluble in cold water, and it gives greater opportunity for the release of any hydrogen entrapped in the surface. Rinsing should be done thoroughly.

Need for suitable acid dip

It has already been emphasized that perfect adhesion can only be obtained by completely removing grease by use of a proper cleaning system. It is equally important that any film of alkaline salts left by the cleaners be removed by means of a suitable acid dip. By far the greatest cause of blistering and peeling lies in the failure to provide perfectly cleaned surfaces.

Requirements for acid dips vary as in the case of alkaline cleaning practices with the operating conditions encountered. An acid concentration and immersion time suitable for hand-dipping operations may be far too drastic for a conveyor operation. In the past, solutions of hydrochloric or sulfuric acid in concentrations ranging from 5 to 10 per cent have been used. There is good evidence that the reduction in intensity of alkaline cleaning needed to avoid copper blistering should be accompanied by a reduction in acidity of the acid dip which follows. A dilute solution (¼ to 1 per cent by weight) of sulfuric or hydrochloric acid is commonly used. For very mild conditions the use of acetic acid has been suggested.

In hand operations where the dipping time can be controlled, immersion periods of the order of five seconds or less are commonly employed. The usual practice is to immerse the work until evolution of gas bubbles has just started. This practice insures that the alkaline materials on the surface are neutralized and removed. In conveyor operations where the immersion time is fixed it is necessary to adjust the acid concentration so that copious gas evolution and visible discoloration of the surface are avoided. Very inferior adhesion of plated coatings will result from failure to use an acid dip. At the same time, however, poor results will be obtained from excessive acid dipping.

Thickness of coating

One eastern company has carried out a large number of service tests on plated coatings applied to zinc. Experiments have been conducted that show that a direct relationship exists between thickness of coating and service life, contrary to the results obtained in most accelerated tests. Experience gained by many large consumers of plated zinc die castings has confirmed this finding and has resulted in the writing of specifications requiring substantial coating thicknesses. W. Blum* and P. W. C. Strausser in reporting on the exposure tests conducted by the Joint Committee on Plated Nonferrous Metals of the American Society for Testing Materials, the American Electroplaters' Society and the National Bureau of Standards furnished strong additional evidence of this relationship.

* W. Blum and P. W. C. Strausser, "Outdoor Exposure Tests of Electroplated Nickel and Chromium Coatings on Steel and Non-ferrous Metals." Bureau of Standards Research Paper No. 1293, Journal of Research. National Bureau of Standards, Vol. 24 1940, page 443.

IN MAY PART 2

Editor's mail → *from Page 14*

interested in securing more information on how the table was built, including construction drawings. Thank you very much.

K. E. Schneider, Engineer
Philco Corporation
Bedford, Indiana

Ed Note: Inquiry forwarded to The Cleveland Vibrator Co., 2828 Clinton Avenue, Cleveland 13, Ohio.

the Mueller Climatrol report

Dear Mr. Chase:
I received the copy of your February issue and the reprint of the Mueller Climatrol feature enclosed. I was certainly proud to see such a comprehensive article covering every phase of Mueller operation. The writing was well done, and the method of presentation was very effective.
As you know, a feature like this gives me a great deal of personal satisfaction as a member of the Mueller tradition. It also confirms my belief in our "team management" idea. This company is today what the many, many people in key positions have strived to make it during the past one hundred years.
Thanks for your fine cooperation.

H. P. Mueller, President
Mueller Climatrol
Milwaukee, Wisconsin

Ed. Note: We thank Mr. Mueller for his kind words. Our thanks also to key people throughout the Mueller Cimatrol organization for the cooperation which made the February report possible.

missed an issue

Dear Sirs: I would appreciate very much to have you start sending me METAL PRODUCTS MANUFACTURING Magazine. I have moved since receiving my last issue. I have missed receiving the magazine as it is something I always looked forward to. I enjoy all the pictures and new developments of enameling — also all the articles. Hoping to receive my copy of your fine magazine again. Thank you.

Mr. Harold Snodgrass
Florence Stove Company
West Station Street
Kankakee, Illinois

booklet by Mr. Spencer

Gentlemen: Enclosed please find $.25 for which send us one copy of booklet containing an article entitled "Formability of Metals", in four parts, by Mr. Spencer. Please mark for the attention of the writer. Thank you.

T. L. Howard,
Purchasing Agent
R. D. Werner Company, Inc.

Gentlemen: I would be pleased to have my name added to your list, with a change of address so as to show:

Robert L. Purcell,
The Siegler Corporation
8352 Brookhurst Avenue
Anaheim, California

—— END ——

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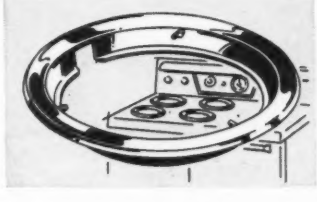
Roll-formed from endless spirals, Pyramid rings cut costs by eliminating waste, yet give you the utmost in sparkling beauty, precision and strength. Choose from an almost unlimited variety of sizes and shapes—in-the-round like these examples, or square or straight—to solve any design problem. When it comes to metal mouldings, come to Pyramid—specialists in roll-formed mouldings for 30 years!



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The trim, sanitary look of gleaming stainless steel burner rings lends *visible sales appeal* to quality ranges —gas, electric or built-ins.

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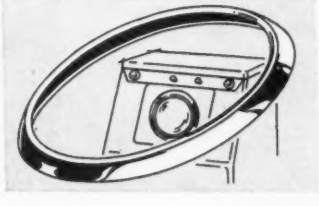
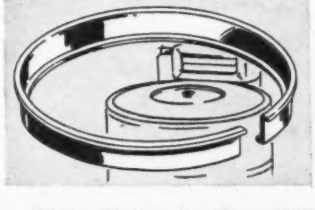
Fabricated with *painstaking precision* for an exact fit to any opening, Pyramid roll-formed bezels "dress up" today's best-selling appliances.





tough!

Rugged structural rings, *designed for heavy duty*, like this girder-strong washer component, are spiral roll-formed at low cost.

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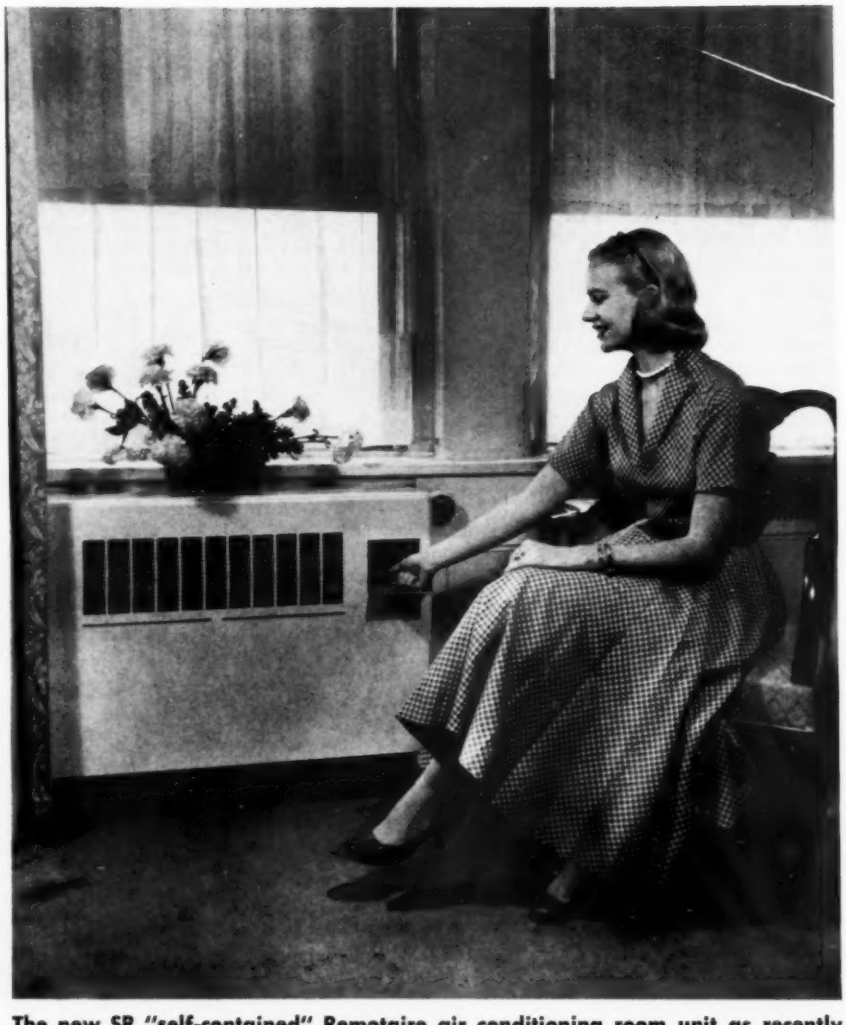
THE MPM spotlight



The new SR "self-contained" Remotaire air conditioning room unit as recently installed in 400 rooms of the Waldorf-Astoria hotel in New York City. The unit can be connected into an existing central hot water or steam heating system. All elements needed for cooling, and controls for conditioning of air are self-contained. Product of American-Standard, Plumbing and Heating Division.

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ONLY when you combine scientific knowledge with practical experience can you get genuine "KNOW-HOW."

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Ing-Rich Frits are the result of this genuine Know-How—the result of exhaustive laboratory research by top flight ceramic engineers who have to prove their case, day in and day out under practical working conditions, in our own large job enameling plant.

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MPM Suggestion Box

Using modern pneumatic equipment to answer a production bottleneck

a case history in portable TV cabinet production

MODERN Tool & Die Company, Cleveland, produces sheet metal exterior cases for Philco's 17-inch portable TV set.

Modern Tool handles the complete job of fabricating, finishing, and assembling the outer shell for these units. They are shipped in carload lots, packed individually in the corrugated cartons bearing the Philco label, and in which the completely assembled unit ultimately reaches the retail outlet and the customer.

When the unit, as made by Modern Tool, reaches the Philco plant, it is removed from the box. The chassis and picture tube, having been already manufactured on the Philco production lines, are assembled in the cabinet. The set is then completely tested, the handles and antenna are attached, and the set is placed back in the original carton.

Philco called and asked them to double their production of these units. This request called for a review of production procedures to streamline operations for the increase.

Modern Tool performs all the necessary stamping and shaping operations on modern presses where the increase of production schedule would not present any particular problem. Similarly, the spray painting and drying operations, which are handled on overhead conveyors direct to the assembly lines, would present no great problem. The one bottle-neck was in the top shell closure, which calls for the placing of 14 screws, 7 on each side of the shell. The fasteners used for this closure are #6 x 3/8-inch round head Type A sheet metal screws, and J-type speed fasteners.

The fasteners had been adopted after they explored all fastening methods. Because of the small size of the screws, and the way in which the work had to be performed within the shell, the only alternative to hand-placing and hand-driving the fasteners seemed to be the use of a pneumatic attachment serving equipment with an offset power driver.

to Page 80 →

This view shows finished sheet metal shells for Philco's portable TV set at the end of the assembly line at Modern Tool and Die Company's plant in Cleveland. Automated screw feeding equipment drives 14 screws for the top shell closure, and saves 180 man hours per 1,000 units.

These two men, aided by the automated screw feeding device which delivers screws to the business end of the power screwdriver, are assembling an average of 300 units during a nine-hour shift. The job, which entails driving 14 sheet metal screws — seven on each side of the shell — would otherwise have required a total of eight operators, working with regular hand drivers.

RCA Whirlpool

SOMETHING NEW HAS BEEN ADDED...

Korolite enamel has been added to RCA-WHIRLPOOL washers and dryers — making them as outstanding on the dealer's floor as the baby with the new red ribbon!

But Whirlpool-Seeger's reasons are soundly practical...

Korolite enamel meets the most exacting mass production requirements • batch-to-batch uniformity • ease and economy of application • uniform color and high gloss retention • positive resistance to detergents, chips, cracks, scratches, stains • cleans easily • resists wear.

And United gives fast *"demand"* delivery from 5 strategically located plants. Let's get acquainted. Ask for one of our paint-problem experts to call at your convenience, and without obligation. We'd like to meet you—perhaps to serve you.

FIVE STRATEGICALLY LOCATED PLANTS

EAST
Benjamin Franklin Paint & Varnish Co.
Philadelphia, Pa.

SOUTHEAST
Carolina Paint & Varnish Works
Greensboro, N.C.

CENTRAL
Illinois Paint Works *Chicago, Ill.*

WEST
Pacific Paint & Varnish Co. *Berkeley, Calif.*

SOUTHWEST
De Soto Paint & Varnish Co. *Garland, Texas*

UNITED

WALLPAPER, INC., 1350 SOUTH KOSTNER AVENUE, CHICAGO 23, ILLINOIS • PHONE: ROCKWELL 2-5000

Industrial Literature

ENAMELING IRON

If you are interested in porcelain enameling, you will be interested in having a copy of the catalog "Armco Enameling Iron." If you are interested in having enameling done, but you do not have facilities for porcelain enameling, this company will be pleased to send you the name of an experienced job enameler near you. If you are interested in either or both of these things, write Dept. MPM, Armco Steel Corp., 777 Curtis St., Middletown, Ohio.

BULLETIN ON APPLIANCE CASTERS

This bulletin describes and illustrates a complete line of casters for appliances, furniture, and various kinds of other moveable products. Many available sizes and styles are listed. Dept. MPM, Nagel-Chase Mfg. Co., 2811 N. Ashland Ave., Chicago 13, Illinois.

BOOKLET ON RUST PREVENTION

A free-flowing compound called Z.R.C., and consisting of 95 per cent zinc dust permanently suspended in a 5 per cent vehicle, is subject of this brochure. The material can be brushed or sprayer on iron or steel (new or in a rusted condition), and small articles may be dipped. Write to MPM, The Sealube Co., Wakefield, Massachusetts.

FINISHES FOR ALUMINUM

A colorful, penetrating handbook prepared by men who know about aluminum finishes. It includes all of the latest and most exciting finishes, and tells how to achieve them. Write Dept. MPM, Aluminum Company of America, 2192 Alcoa Building, Pittsburgh 19, Pa.

PLAN BOOK OF METAL MOULDINGS

This book contains actual case histories of unusual design problems solved by the manufacturer. It also outlines facilities, designs, and products available. For your copy write Dept. MPM, Pyramid Mouldings Inc., 5365 W. Armstrong Ave., Chicago 30, Ill.

UTILIZATION OF PREFABRICATED WIRING DATA AVAILABLE

Applications possessing high density of wire and component connections may benefit by utilization of printed circuit panels. The printed circuit technique offers possibilities for advanced product design and manufacture. For full information on how to design for printed circuit panels, write on company letterhead for the second edition of the handbook "Utilization of Prefabricated Wiring." Dept. MPM, Methode Manufacturing Corp., 2021 W. Churchill St., Chicago 47, Ill.

A DETAILED PHOSPHATING FOLDER

A detailed phosphating folder, covering the entire Turcoat line of phosphating and metal protective coating materials has been issued. A portion of this folder is devoted to a general discussion of phosphating. Included in this portion are diagrammatical cross-sections of how phosphating works, application photographs and a discussion of the use of coating materials as bonds for paint, as bonds for other organic finishes, as anti-friction coatings, and as agents to protect unfinished metals from corrosion.

Also featured is a valuable phosphating reference chart, which describes the purpose and make-up of each type of coating, recommended uses, applicable government specifications, methods of application, equipment requirements, metals that can be coated, coating weights, and basic operational cycles. Copies of the folder may be obtained by writing Dept. MPM, Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif.

DATA SHEET ON NEW SYNCHRONOUS TIMING MOTORS

A data sheet describing new synchronous timing motors has just been released. The new motors feature bearings that require no lubrication, and are designed specifically for use in timers subjected to temperatures up to 165° F. The data sheet includes all specifications as well as a complete description of special features and uses. Some of the applications include gas and electric range timers, animated display timers, and timers for packaging and plastic molding machinery. Detail drawings are included. Dept. MPM, The Lux Clock Manufacturing Co., 95 Johnson St., Waterbury, Conn.

WATER WASH SPRAY BOOTH

The manufacturer of this new water wash spray booth states that it is easier to maintain, requires little maintenance, and needs less floor space. For a descriptive bulletin write Dept. MPM, Binks Manufacturing Co., 3122-40 Carroll Ave., Chicago 12, Ill.

PRE-PLATED METAL SAMPLER-SELECTOR

This free sampler-selector contains eight actual metal samples, plus specifications and typical uses for pre-plated metals. You can choose from finishes of chrome, nickel, copper or brass on steel, zinc, copper, brass, and aluminum. Sheets, strips, coils. Write Dept. MPM, American Nickeloid Co., Peru 11, Ill.

INLAND BOXES BUILD GOOD WILL

This booklet fully illustrates the services, facilities, and products of this manufacturer of corrugated fiber boxes. If you are interested in complete information on this company, write Dept. MPM, Inland Container Corporation, Indianapolis 6, Ind.

HOME LAUNDRY CONTROLS

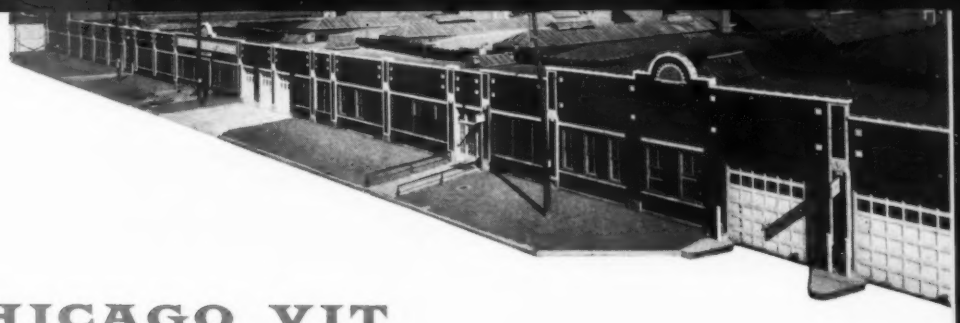
This company offers a complete line of electrical components for the home laundry industry. Controls custom-designed to meet your specific requirements are offered. For complete details and facts, write for your data folder on Soreng Controls. Dept. MPM, Soreng Div., Controls Company of America, 9559 Soreng Ave., Schiller Park, Ill.

FILTRATION FOR INDUSTRY

This two color, 8-page bulletin illustrates the various types of standard Delpark filters. A description of their methods of filtration, the degree of filtration each will perform, and their more common applications is covered. Write for "Filtration for Industry", Dept. MPM, Industrial Filtration Co., Lebanon, Ind.

PACKAGING ECONOMY STRESSED IN NEW BOOKLET

Packaging cost reduction — from original package design to final product shipment — is the subject of a revised "Little Packaging Library" booklet. Titled "How to Ship More Economically in Corrugated Boxes," the 24-page publication includes pertinent advice on the designing, testing, and storing of product packages. For your copy, write Dept. MPM, Hinde & Dauch, Sandusky, Ohio.



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the vision of research becomes the product of tomorrow

For
Finest Frit
Chicago Vit

A never ending search for product improvement is the byword here at Chicago Vit. Just one phase, but an important one in enamel development work, is the experimental smelting of new frit formalae which frequently are individualized to meet specific plant or product conditions—tailor made! From this meticulous work come new frits that bring many tangible benefits to Chicago Vit customers in the manufacture of all types of porcelain enameled products. 24 hours a day this experimental smelting department, whose capacity alone would be sufficient to supply the needs of several small plants, is working for you . . . to bring you better frits that help you pack more sales appeal into the products you build.

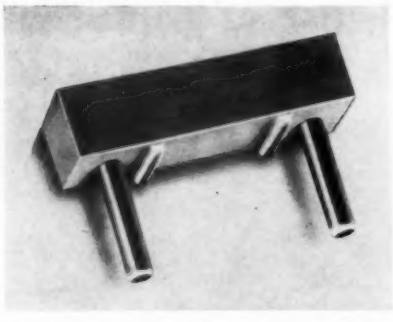
A section of the main room of the Research and Development Laboratory

Chicago Vitreous CORPORATION

1425 SOUTH 55TH COURT, CICERO 50, ILLINOIS

New Supplies and Equipment

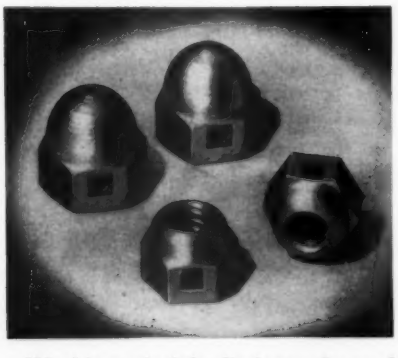
NEW FUSE RESISTOR



A new, completely insulated fuse resistor, which functions as a resistor under normal conditions and as a fuse under abnormal conditions supplies the need for a small, compact, fully-insulated resistor-fuse combination that can be easily plugged into a receptacle. Its unique construction provides mechanical strength and simplicity of the complete unit. The resistor also prevents overloading of more valuable components and possible fire due to short circuit. International Resistance Co., 401 N. Broad St., Philadelphia 8, Pa.

THRU-TAPPED CAP NUTS

A "thru-tapped" cap nut, for use primarily on outdoor and indoor steel and aluminum furniture, appliances, plumbing fixtures, and in other decorative applications, is now on the market. Its design makes it possible to gain the decorative advantage of a cap nut in applications where it is impossible to seat a regular cap nut, according to the manufacturer, and it is claimed that the



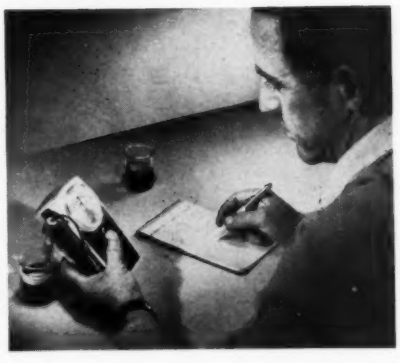
self-locking principle eliminates the need for washers, speeding assembly and reducing inventory requirements. Reusable many times without appreciable reduction in torque, the self-locking nuts use a tough, resilient pellet of nylon permanently imbedded in the nut, projecting beyond the threads, and, when engaged, is compressed by the mating threads. Attempting to regain its original shape, the pellet actually "grows" into the threads, and it is claimed that it will not shake loose under severe conditions of vibration or heat. The locking action is positive whether the nut is seated or not. The Nulok Corp., 611 Industrial Ave., Paramus, N. J.

NEWLY-DESIGNED SPRAY GUN

A spray gun, Model 21, said by the manufacturer to have a short, compact head, a two-finger trigger with easy

pull, and a comfortable, proportioned handle assuring perfect balance for tireless operation, has been developed. The one-piece shell, of heat treated aluminum with an anodized aluminum finish, chrome plated, has a new dual-purpose air valve permitting the use of air from horn holes only, or center air cap holes only, or an intermixture of any proportion of air from these sources. The pattern and fluid needle adjusting knobs are large and easy to operate, and large, unrestricted air passages of short travel through the gun assure ample volume to atomize the heaviest materials. Paasche Airbrush Co., Div. of Cline Electric Mfg. Co., 1909 Diversey Parkway, Chicago 14, Ill.

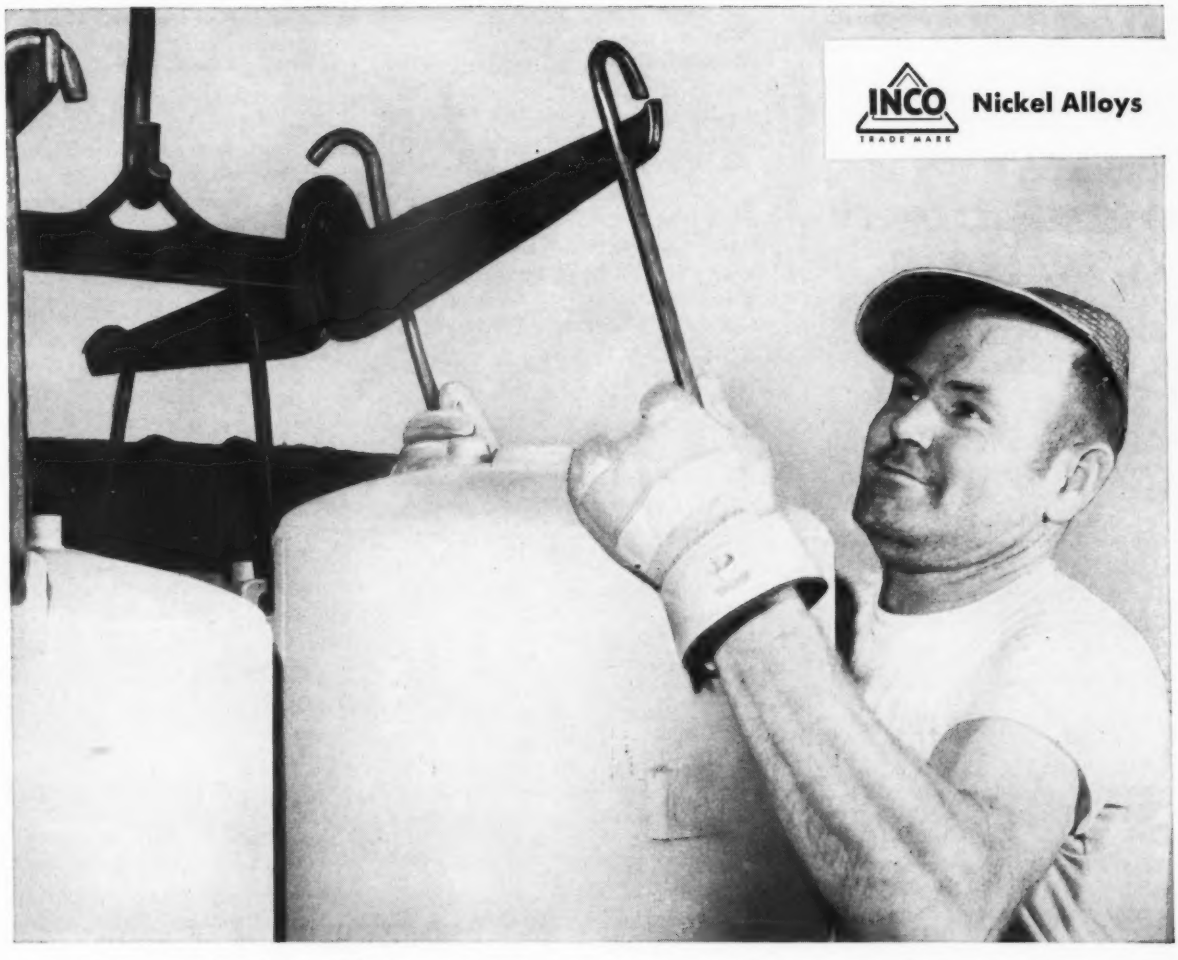
POCKET-SIZE pH METER



A versatile, low-priced, pocket-size pH meter for acidity and alkalinity measurements that is accurate, dependable, easy-to-operate and uses a combination electrode is in production. The new "pocket pH meter" is a battery-operated instrument with a range of from 2 to 12 pH. The single electrode combines both the reference and glass electrodes and has been especially developed for use with the new "pocket pH meter." The instrument also has a "memory" dial for use in standardizing. The instrument operates from simple, inexpensive batteries like those used in flashlights and hearing aids. Scientific Instruments Div., Beckman Instruments, Inc., 2500 Fullerton Rd., Fullerton, Calif.

NON-CORROSIVE NYLON WHEELS

A new chain with nylon wheels for materials handling applications has been announced. This new combination of nylon wheels and stainless steel bearings offers distinct advantages to users in a variety of industries. Wheels of nylon, running fully enclosed on a steel track, are approximately 80 per cent more quiet than steel wheels running on steel track. Where moisture is a problem, stainless steel bearings and nylon wheels combine to eliminate bearing corrosion. Tests have proved that the new chain outlasts standard steel chain — especially where water or high humidity conditions exist. Nylon wheels and stainless steel bearings are resistant to most common organic solvents, alkalis, and most organic acids. Materials Handling Div., Richards-Wilcox Mfg. Co., 444 W. Third St., Aurora, Ill.



These strong ½-inch Inconel hooks carry tanks for a water heater . . . have given 27 months' service in continuous enameling furnace operation with not a single failure and many, many months of future service predicted.

Burning hooks with an earning way!

Inconel stops pile-ups on long production runs

At the Kent Corporation, El Monte, Calif., they enamel workpieces for major appliances. A broken hook on a long production run can cost them *plenty* . . . furnace downtime until they get fallen pieces out . . . spoilage of work in progress.

So Kent relies on rugged hooks of Inconel* nickel-chromium alloy to prevent pile-ups. Inconel, they've found, gives needed "sure" life. It stays strong despite heat . . . despite corrosive attack at temperatures up to 1650°F.

And Kent reports *another* advantage of Inconel: its tightly adhering oxide film doesn't scale readily . . . prevents high-cost spoilage of enameled surfaces.

Hook up with Inconel to stop furnace pile-ups. You'll discover other advantages, too. Its easy fabricability. The extra heavy loads it carries. How small, lightweight Inconel fixtures save fuel. You'll discover that Inconel burning tools *earn* their way!

"Keeping Costs Down As Temperatures Go Up"

This big, illustrated booklet contains many suggestions on extending equipment life. Write us for a copy.

* Registered Trademark

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

Inconel... *for long life at high temperatures*

NEW
from
MEYERCORD

NAMEPLATE
DECALS

If you have adhesive problems with the water applied decals you are now using...switch to NEW MEYERCORD TYPE I

This is BIG NEWS about a new addition to the Meyercord "family" of commercial nameplate decals! Meyercord has perfected a completely new water applied decal nameplate with revolutionary advantages.

This new TYPE I Decal instantly grips virtually any commercial surface with bulldog tenacity. It will cling and adhere with ease to acrylics, metal (painted or unpainted), melamines, polyethylenes . . . to mention only a few of the more difficult.

TYPE I Decals are applied with all the usual ease of any water applied decal but they do not depend upon water solubility for adhesion. Even if oversoaked for long periods there is no damage or adverse effect on the adhesion. TYPE I Decal Nameplates can be designed to include colorful halftones as well as plain poster-style designs. However, for the present, this new TYPE I Decal can be manufactured in production line quantities only.

Let us prove that TYPE I can be the answer to the most stubborn nameplate problem. Send sample of surface and material—for samples and full information. Request on company letterhead. No obligation.

THE MEYERCORD CO.
World's Largest Decalcomania Manufacturers
Dept. F-321, 5323 W. Lake St., Chicago 44, Illinois

Suggestion box

→ *from Page 74*

With one operator placing the fasteners over the holes in the matching pieces of the shell, which are held firmly in a special fixture, the operator of the pneumatic serving machine on the opposite side of the table reaches in and drives the screws just about as quickly as the clips are placed. The shells are then placed on an overhead conveyor which carries them through the spray painting and drying sequence to the end of the line where insulating pads are applied with an adhesive. Finally, the mask in which the TV tube is later framed is applied, and the whole assembly is placed in the shipping carton.

The company reported that with two people on the job, and using the pneumatic machine, they had been assembling 300 units on a 9-hour assembly shift. This means that the team was installing 466 fasteners per hour, or nearly 8 per minute.

It was estimated that it would be necessary to put eight additional people on this assembly job in order to meet the requirements of the new schedule, which called for doubling daily production.

Before applying this assembly method to TV cabinets, Modern Tool had previous experience in using it to assemble power mower mufflers. In this instance, production was stepped up from 1,100 to 2,500 units per day, and the cost of assembling metal cover plates to the body assembly was cut from $32.00 per thousand to approximately $21.00 per thousand.

13th Industrial Heating and Ventilating Exposition

→ *from Page 63*

The 63rd annual meeting of the American Society of Heating and Air-Conditioning Engineers was held concurrently at the Conrad Hilton Hotel. Morning sessions were held for a four day period from February 25th through February 28th. Papers were presented on such subjects as: "Cold Wall Effects In A Ceiling-Panel-Heated Room," "Typical Dehumidification Problems and Their Solutions," "Air Flow in Free Convection Over Heated Bodies," etc.

The next meeting of the society will be the semiannual meeting, June 24-26, at Murray Bay, Quebec, and the 64th annual meeting will be in Pittsburgh, January 27-29, 1958.

More foreign visitors attended the exposition than ever before. There were representatives from forty states and from nearly twenty foreign nations. Exposition manager Stevens commented, "This reflects not only the growing importance of the export market in the industry but it indicates that the industrial comeback in various foreign nations has been tremendous within the past year."

Next exposition

As the exposition closed, announcement was made that the 1959 event will be held in Philadelphia, with the 2nd Southwest Heating and Air-Conditioning Exposition scheduled for Dallas, Texas in 1960—both under the auspices of the American Society of Heating and Air-Conditioning Engineers.

Pressed Metal Institute

→ *from Page 56*

Die maintenance

The complete afternoon of Thursday was devoted to "Die maintenance and related problems".

Group sessions, broken down by size of stamping plants, were followed by a general session where the principal points discussed were summarized.

The social highlight of the PMI meeting was a "Penthouse Party" on Thursday evening, staged in the penthouse of Cleveland's Theatrical Grill.

Trouble in deep drawn parts

Friday morning saw PMI members visiting two Cleveland plants: Chevrolet-Cleveland Division of GMC, and The Barth Corporation.

J. W. Kootz, sales engineer, S. W. Evans & Son, Philadelphia, and chairman, PMI Technical Research and Standards committee, officiated at the Friday luncheon at which the John Woodman Higgins award was presented to Mr. Ernest J. Urbas of the Guarantee Specialty Manufacturing Co. of Cleveland, Ohio.

For an interesting windup of the three-day program, the committee presented Stanley R. Cope, president, Acme School of Die Design Engineering, South Bend, Ind., whose subject was "Finding and solving the causes of trouble in deep-drawn parts".

The attendance of representatives of metal stamping companies was up 20 per cent over the 1956 meeting, according to a report by the PMI staff to MPM as the 1957 sessions closed.

MACCO MACHINE CLEANER 71-D prevents RUST SPREAD & BLISTERS

a phosphate cleaner and rust inhibitor

LEADING METAL PROCESSORS

Indorse its Use for . . .

- **CAMERAS**
- **TV CABINETS**
- **APPLIANCES**
- **TAPE RECORDERS**
- **LAWN FURNITURE**
- **MOLDING**
- **TOYS, etc.**

MACCO 71-D is by far the most efficient and economical method of preparing metals for the finest and longest lasting paint job. Laboratory and shop tests prove that, on steel, cast iron, aluminum or die cast, MACCO 71-D provides a corrosion-resistant phosphate coating comparable in quality to that formerly available only through expensive and involved methods of preparation.

MACCO M. C. No. 71-D CLEANER

• 1. Cleans metals and etches in one operation. • 2. Is more economical because of solution's longer life. • 3. Gives microscopic phosphate coating, greatly aiding in paint adhesion and corrosion resistance. • 4. Requires no special equipment. • 5.Never hardens in the drum. • 6. Gives excellent protection against rust prior to painting. • 7. Makes it simple to control solution. • 8. Can be run in conventional one, two, or three stage washers, and in other types.

MACCO PRODUCTS COMPANY

Manufacturers of Better Metal-Working Compounds since 1931

9210 SOUTH SANGAMON STREET • CHICAGO 20, ILLINOIS • PROSPECT 9-0800

Verson tool-up at Maytag Plant No. 2 produces a variety of parts for Automatic Washers

Two Verson hydraulics and three Verson full eccentric presses, shown above at the Maytag Plant No. 2 in Newton, Iowa, perform deep drawing, punching, forming and trimming operations on a variety of parts for the Maytag Automatic Washer. These presses, designed and engineered by Verson, were tailored to Maytag requirements to be a part of the complete manufacturing program.

All Verson presses represent the ultimate in press design. But, more important, they are engineered, not only as presses, but as integral parts of your production process.

Take advantage of Verson's experience and facilities and put real production know-how to work for you. Send an outline of your requirements today. We will be happy to make specific recommendations.

A Verson Press for every job from 60 tons up.

TRADE Verson MARK

ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

VERSON ALLSTEEL PRESS CO.

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MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES

TRANE REPORTS SALES UP 38% PROFIT SHOWS 66% INCREASE

The Trane Company, LaCrosse, Wis., manufacturing engineers of air conditioning, heating, ventilating, and special heat transfer equipment, reported 1956 year-end figures showing total sales up 38 per cent and profit 66 per cent ahead of 1955.

Consolidated sales increased from $54,061,937 in 1955 to $74,443,851 in 1956.

Profit moved up to $5,739,618 for 1956, compared with $3,452,753 in 1955, the previous high.

A six-week strike in the fall of 1955 should be taken into account when comparing figures for the two years, company officials pointed out.

Backlog of $31,600,000 at the end of 1956 was the highest in the history of the company, the report states.

EASY PUSHES TOP-LINE IN AD & PROMOTION CAMPAIGN

According to Parker H. Ericksen, vice president, Easy Laundry Appliances, Chicago, division of The Murray Corporation of America, the Easy Combination washer-dryer and the 1957 Regent washer will be the main targets in the company's 1957 sales promotion and advertising campaign. As a kick-off, the Combination washer-dryer was featured in a 4-color "three-way" gatefold spread in the May issue of *Better Homes and Gardens.*

"The spring campaign is a concerted push of top-line Easy products aimed at both consumer and dealer," according to Ericksen. "But it's only the beginning. Our promotional plans will expand in the coming months, to merchandise Easy top line laundry products as today's number one household necessity," he said.

ANDREWS ON INSPECTION TEAM

Dr. Andrew I. Andrews, head of the University of Illinois department of ceramic engineering, was named to a team of educators to make an accrediting inspection of the Georgia Institute of Technology, Atlanta, Ga., for the engineers council for professional development.

VACUUM CLEANER FACTORY SALES SECOND BEST JANUARY SINCE '51

Factory sales of standard-size household vacuum cleaners in January totalled 276,738 units, down 1.5 per cent from 281,025 cleaners sold in December.

January was below January, 1956 sales of 302,203 units by 8.4 per cent, but was otherwise the best January in the industry's history since 1951, when sales in the month aggregated 282,305 units, according to figures for the industry announced by the Vacuum Cleaner Manufacturers' Association.

—*"There's danger in dust and dirt!"*—

KELVINATOR-LEONARD REPORTS SALES GAINS ON APPLIANCES

Kelvinator and Leonard sales of major household appliances set an all-time record in January, according to Homer L. Travis, vice-president in charge of Kelvinator sales. Billings to dealers were 12 per cent above the same month a year ago, the best previous January, Travis said.

Automatic washers, clothes dryers, and room air conditioners all recorded new January highs. Automatic washers gained 14 per cent over 1956, and dryers six per cent. Room air conditioner billings were more than double Kelvinator's best previous January.

Although they did not set all-time records, Travis said, freezer and refrigerator sales showed important gains over the comparable 1956 period, with freezers up 35 per cent, and refrigerators up 11 per cent.

U. S. AIR CONDITIONING AND HUGHES-KEENAN TO MERGE

The boards of directors of United States Air Conditioning Corporation, Philadelphia, and the Hughes-Keenan Corporation, Delaware, Ohio, an-

to Page 84 →

FBI RETURNS $50,000 JEWEL-CRESTED COFFEEMATIC TO LANDERS

America's most famous coffeemaker, the $50,000 solid gold, diamond and ruby-studded Coffeematic, was freed by the FBI recently and returned to its owners, Landers, Frary & Clark, makers of Universal Appliances, at the company's general offices in New Britain, Conn.

The coffeemaker, after a tour of 34 department stores throughout the country, had been on loan to the National Polio Foundation for the promotion of their 1957 March of Dimes campaign. Wives of the governors of some 30 states had poured from the classic coffeemaker at their "First Lady" kick-off fund-raising coffee parties before it was stolen at the Logan airport.

Once back in New Britain, the jewel-studded coffeemaker was again released by its owners for further showing throughout the country.

Stanley G. Fisher, vice president and general sales manager, and H. S. Perkins, Electric Housewares sales manager of Landers, Frary & Clark, are shown accepting the diamond and ruby-studded solid gold Coffeematic from U. S. Deputy Marshal Thomas J. Reavey. L. to r. are: Commissioner Leonard P. Birnbaum; Chairman Peter J. Daddario of the Police Board; Perkins; Policeman Cyril J. Connelly; Chief Deputy Marshal John E. Collins; Fisher; and Reavey.

nounced through their presidents, David E. Feinberg and G. W. Way, respectively, an agreement to merge subject to the approval of the stockholders of both companies.

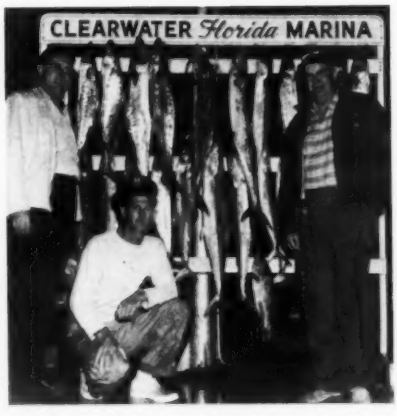
U. S. Air Conditioning manufactures a full line of packaged air conditioning equipment for home, commercial, and industrial use, and related heating and ventilating products. Wholly and partially-owned subsidiaries produce domestic furnaces and gas-fired unit heaters. Hughes-Keenan manufactures cranes for industrial and railroad use, and light truck bodies.

BACKLOG OF ORDERS FOR IHEA REACH ALL-TIME HIGH

The backlog of orders for industrial furnaces is now at an all-time peacetime high, the Industrial Heating Equipment Assn. anonunces. As of December 31, 1956, the IHEA member companies reported a backlog of $110,554,000 in orders for industrial furnaces. This is an increase of 42 per cent over the comparable figure for December 31, 1955 — $77,758,000.

Shipments of industrial furnaces for 1956 totalled $123,344,000 among the IHEA member companies. In 1955, the figure was $77,758,000.

PROOF OF ANGLING SKILL



A. G. (Tony) Feldmeier, president, Marsco Mfg. Co., Chicago, and Herb Mills, president, Mills Products, Inc., Walled Lake, Mich., are shown with their guide and a recent Florida catch. It would appear that both men had a fine day to produce this "boat load" of Kingfish.

SLATER ELECTRIC JOINS NEMA

The National Electrical Manufacturers' Assn. announces that it has welcomed to its membership the Slater Electric & Manufacturing Co., Inc., 45 Sea Cliff Ave., Glen Cove, N. Y., manufacturers of electrical wiring devices, plugs, and switches. Representing the company on the Wiring Device Section are: Saul I. Slater, president; Herbert A. Slater, secretary; Thomas S. Slater, and Charles Boltson, chief engineer.

REFRIGERATOR AND FREEZER SAFETY EDUCATIONAL PROGRAM

The Household Refrigerator and Freezer Section of NEMA, in cooperation with the National Safety Council, is promoting a safety educational program to make the parents of young children, and owners of discarded refrigeration cabinents, aware of the potential suffocation hazards, and to explain the proper precautions that can be taken to minimize such hazards.

STRONG SEASONAL GAIN FOR GAS WATER HEATERS

Shipments of automatic gas water heaters in January showed unusually strong seasonal gains, although the figure was below the record total for the same month a year earlier, the Gas Appliance Manufacturers' Association announced recently.

Edward R. Martin, GAMA director of marketing and statistics, said January shipments totaled 227,300 units. This

ACTIVATED CLEANING
breaks phosphatizing bottleneck
Hey, Joe, these door panels need two coats of paint. What's wrong?
Can't control the phosphate coating weight—crystals are too big. We'll hand rub the next few panels.
Hi, Jim, get me out of this jam. We need a uniform, lightweight zinc phosphate coating.
You're talking my language, Joe. Ever hear of Pennsalt activated cleaning and Fosbond?
In your normal cycle, and with no hand rubbing, Pennsalt activated cleaning gives you a refined, lightweight Fosbond coating.
"But how does Pennsalt know so much about phosphate coating? It's a pretty new field."
"We called on our wide knowledge of all phases of metal surface preparation—cleaning, surface-activation, and phosphatizing . . . Don't forget, nobody knows more about metal-processing chemistry than Pennsalt."
A MONTH LATER

represents a 4.9 per cent dip from the 239,000 automatic gas water heaters shipped in January, 1956, but a wide gain from the 156,800 listed for December. This latest total is the second highest ever recorded for the month of January.

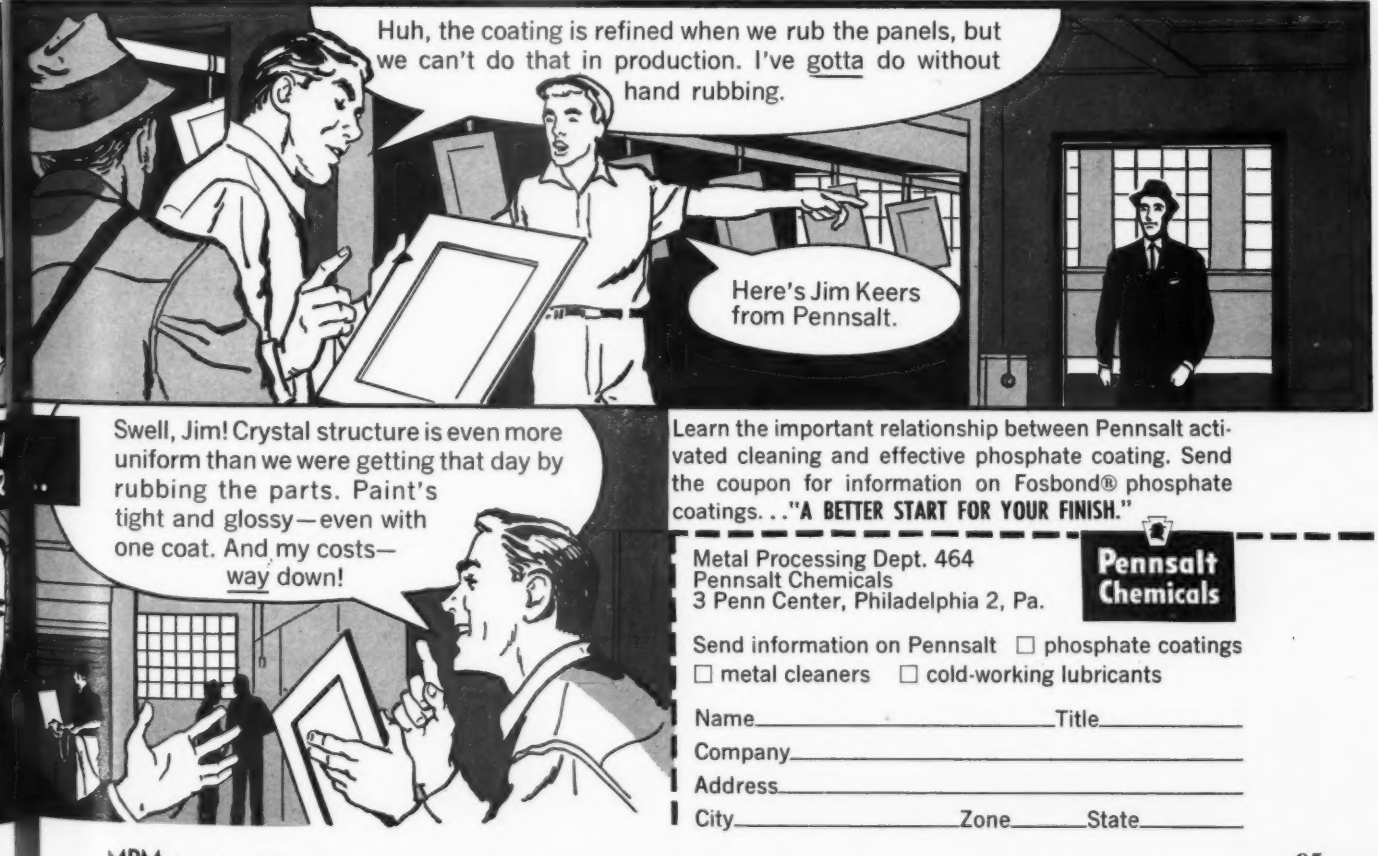
WIVES WIN AWARDS FOR HOME FREEZER DESIGN

A contest designed especially for a group of people usually excluded from participation in contests was concluded recently when five wives of employees of Whirlpool-Seeger Corp., St. Paul, Minn,. were presented with "Outstanding Recognition" awards for suggestions which may determine important design and functional features in the home freezer of the future.

Judged by company executives and engineers, the five most original, useful, appealing, and practicable ideas resulting from a questionnaire mailed to some 1200 women employees, and wives of employees, were the suggestions of the following: Mrs. Dorothy Sorlie, Mrs. Louise F. Horan, Mrs. Hough, Mrs. June Bjorkman, and Mrs. Olive Sander.

Designated Whirlpool-Seeger "Fashion Engineers" by Neil Griebenow, vice president and general manager of the St. Paul division, the five winners spent the day at the plant as guests of Griebenow. After a morning tour of the factory, and a luncheon given in their honor, the women were briefly schooled in design, engineering, manufacturing, and testing procedures by various company executives. Each of the winners was awarded a 1957 home appliance.

Four of the winners in contest conducted by Whirlpool-Seeger Corp. examine an RCA-Whirlpool chest freezer with Neil Griebenow, vice president and general manager of the division. Company executives and engineers judged contest entries.


Huh, the coating is refined when we rub the panels, but we can't do that in production. I've gotta do without hand rubbing.
Here's Jim Keers from Pennsalt.
Swell, Jim! Crystal structure is even more uniform than we were getting that day by rubbing the parts. Paint's tight and glossy—even with one coat. And my costs—way down!

Learn the important relationship between Pennsalt activated cleaning and effective phosphate coating. Send the coupon for information on Fosbond® phosphate coatings. . . **"A BETTER START FOR YOUR FINISH."**

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Pennsalt Chemicals
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Pennsalt Chemicals

Send information on Pennsalt ☐ phosphate coatings
☐ metal cleaners ☐ cold-working lubricants

Name_____ Title_____
Company_____
Address_____
City_____ Zone_____ State_____

LET THE SPECIALIST FROM NATIONAL LOCK HELP SOLVE YOUR APPLIANCE HARDWARE PROBLEM

The National Lock sales engineer is fully qualified to recommend the "best" hardware for your product line . . . best in decorative styling . . . best in functional design . . . best in quality components. If your requirements call for custom-built hardware, our specialists will work with your designers in creating smart, modern hardware . . . engineered to cost you less. Write us for full information on how we can be of service to you.

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- Standard and Custom-Built Refrigerator Hardware
- Shelf Supports
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- Stampings
- Screws and Bolts
- Casters
- Finished Pressure Zinc Die Castings
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- Range Hardware
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NATIONAL LOCK COMPANY
Rockford • Illinois
Refrigerator Hardware Division

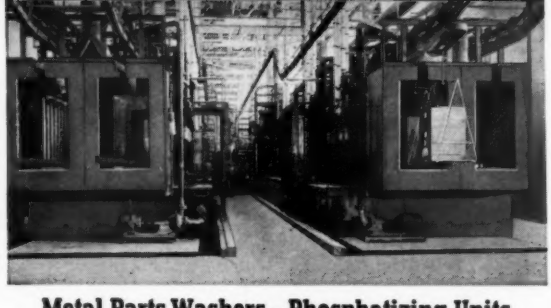
PORCELAIN ENAMELING CAPACITY AVAILABLE

Due to recent product transfers, we have a completely equipped porcelain enameling department available for volume processing of your enamel ware. Equipment comprises two continuous type electric furnaces, conveyorized automatic ground and cover coat spray lines, pressurized spray booths, dryers, sandblast, mills, etc. We can enamel both steel and cast iron. We can also fabricate and weld your enameled parts. If you are seeking a porcelain enameling source, your inquiries and inspection are invited.

Plant Manager,
FLORENCE STOVE COMPANY
Lewisburg, Tennessee

NEWCOMB-DETROIT EST. 1912

- INDUSTRIAL OVENS
- DUST COLLECTORS
- SPRAY BOOTHS
- PARTS WASHERS



Metal Parts Washers—Phosphatizing Units —Hydra-Spray Pickling Equipment

Metal parts are cleaned and processed by means of pressure sprays which converge on the parts from all angles. Solutions are heated to required temperatures by gas, oil or steam immersion heaters. Spray solutions remove foreign matter and perform metal treatment as required.

For Bulletins and Quotations, write to:
NEWCOMB-DETROIT
5771 RUSSELL ST. • DETROIT 11, MICH.

WESTINGHOUSE TO MANUFACTURE APPLIANCES, TV, RADIO FOR WARD

Westinghouse Electric Corporation and Montgomery Ward & Company announced they have entered into an agreement whereby Westinghouse will manufacture a new line of automatic washers and clothes dryers, as well as radio and television receivers, for the Montgomery Ward line.

The firms said the products will be manufactured according to design and performance specifications set by Montgomery Ward. Ward executives likewise will establish their own styling and functional characteristics.

First units to be made under this contract will be for the current Montgomery Ward TV-radio line, and for the 1958 Montgomery Ward laundry equipment line. They will be manufactured at the Westinghouse appliance plant in Mansfield, Ohio, and the TV-radio plant at Metuchen, N. J.

NEW ASSIGNMENTS FOR NEMA PROMOTIONAL-ENGINEERING

Roderic D. Smith and Roland L. Nims have been appointed to direct sales promotional and engineering activities of major appliance, electric housewares, electric fan, and commercial cooking equipment sections of the National Electrical Manufacturers Association, it was announced by Joseph F. Miller, managing director of NEMA. These activities were formerly handled by the late Leo. K. Fox, who died November 27 of last year.

Both Smith and Nims have been members of the NEMA staff for several years. They will continue as recording secretaries for two of the NEMA subdivisions which they have served in the past, as well as act in the same capacity for the additional sections to which they have been assigned.

Smith will be recording secretary, major appliance division, and of the division's constituent sections: electric range, electric water heater, household refrigerator and freezer, household sink unit, and dehumidifier. In addition, he will continue as recording secretary of the NEMA switchgear section.

Nims will be recording secretary, electric houseware, electric fan, and commercial cooking equipment sections. He will continue as recording secretary of the NEMA motor and generator section.

O'BRIEN RESIGNS AS TOASTMASTER VICE PRESIDENT

W. E. (Bill) O'Brien has announced his resignation, effective March 15, as vice president of Toastmaster Products division, McGraw-Edison Co., Elgin, Ill., after nearly a quarter century of service.

O'Brien, long a prominent figure in the electrical appliance industry, announced that he will take an extended vacation, after which he will devote himself to his other business interests. He started with Toastmaster in 1934 as a sales representative, and has served in various positions of responsibility through the years, becoming vice president in 1954. Currently, he is vice president of The National Housewares Manufacturers' Assn.

ADMIRAL SHIPS RECORD NUMBER OF APPLIANCES IN JANUARY

Admiral Corporation's factory shipments of refrigerators and freezers for January were the highest in any January since the company has been in the appliance business, it was announced by J. R. Oberly, vice president-appliance division.

Freezer sales in January were 67 per cent ahead of the comparable month of 1956, while refrigerator movement was 32 per cent higher.

'56 COMPRESSOR BODY SHIPMENTS UP 37% OVER '55, REPORT

Manufacturers' shipments of compressor bodies used in air-conditioning and refrigeration units were up more than 37 per cent during the first eleven months of 1956, as compared with the same period of 1955, it is reported by Geo. S. Jones, Jr., managing director of the Air-Conditioning and Refrigeration Institute. The figures, *which do not include compressors used in household refrigerators,* were compiled from reports made to ARI by manufacturers whose output is estimated to represent in excess of 90 per cent of the industry, he said.

Actual shipments for the eleven-month period totaled 4,477,457 units, compared with 3,262,566 in the same period of 1955. November shipments in 1956 were 276,958 units, against 239,027 in November a year earlier. These totals do not include compressors designed for use with ammonia refrigerants.

RETMA REPORTS SHARP RISE IN TRANSISTOR SALES FOR 1956

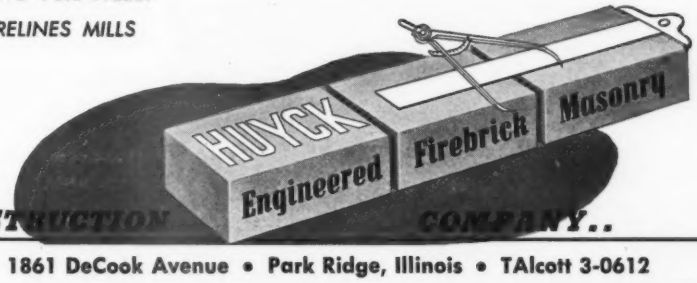
Manufacturers' sales of transistors in 1956 were nearly four times as great as they had been a year earlier, the Radio-Electronics-Television Manufacturers' Assn. announced recently in releasing a Marketing Data Department compilation. A similar increase in transistor sales had been recorded by RETMA for the calendar year 1955, indicative of the continued rise in application of the semi-conductor device.

Factory sales of transistors totalled 12,840,000 units last year, compared with 3,646,802 units sold in 1955. Sales of transistors in 1954 had totalled 1,317,327 units, RETMA said.

The 1956 sales were valued at $37,-352,000 at the factory level, compared with a value of $9,860,062 in 1955, and $5,122,266 in 1954.

HUYCK *FURNISHES FIREBRICK MASONRY TO BUILD, REBUILD AND REPAIR ALL TYPES OF: ENAMELING FURNACES . . . FRIT SMELTERS . . . ALUMINUM, BRASS, LEAD SMELTERS . . . FORGE FURNACES . . . HEAT TREATING FURNACES.*

HUYCK *LINES AND RELINES MILLS*



HUYCK *MASONRY IS GUARANTEED TO GIVE YOU BETTER PERFORMANCE AND LONGER LIFE*

Huyck CONSTRUCTION COMPANY..

1861 DeCook Avenue • Park Ridge, Illinois • TAlcott 3-0612

Concurrently with the transistor figures, RETMA reported that nearly 7.1 million television receivers were shipped to dealers during 1956, to become the fourth highest year on record. During the last year, 7,028,456 TV sets moved into the hands of dealers, compared with the all-time high of 7,421,978 in 1955, and 7,161,362 and 7,078,000 in 1954 and 1955, respectively.

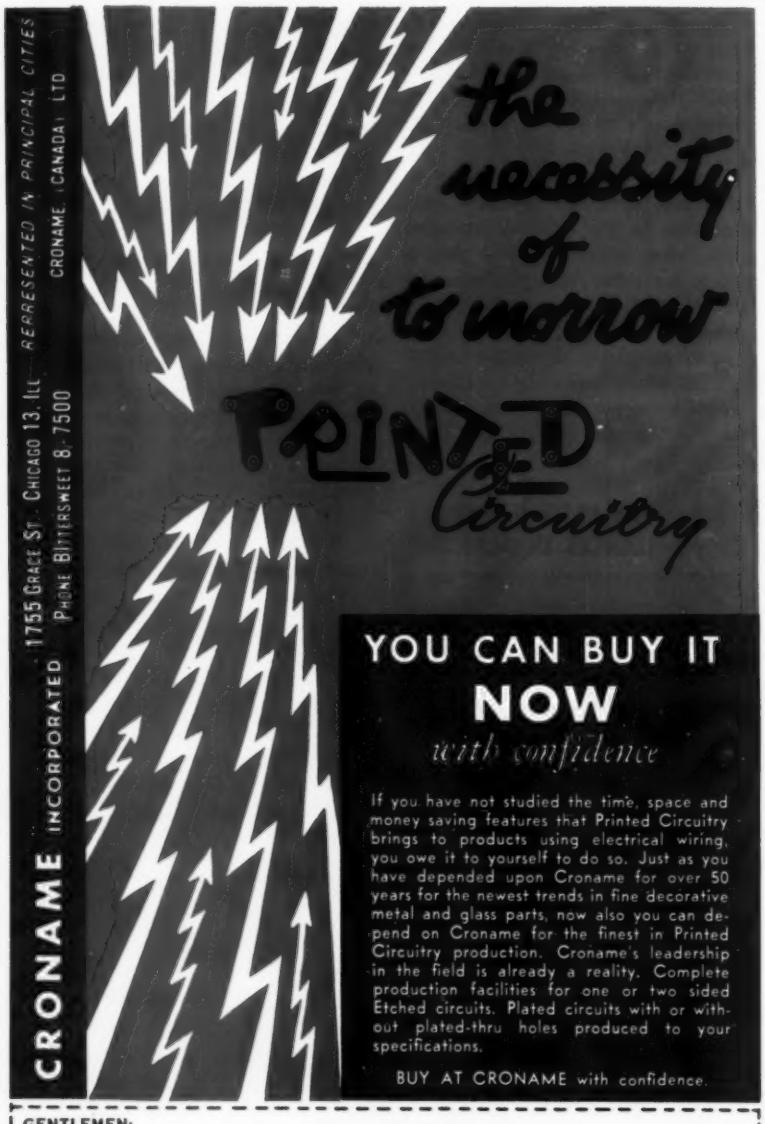
STATE NEON OF HOUSTON BUYS JONES NEON OF BEAUMONT

It is reported that State Neon Products, Inc., with headquaters in Houston, Texas, has bought out Jones Neon Sign Co., Beaumont, Texas, and will operate in that area under the name of State Neon Products, Inc. State Neon operators Victor Coppinger, Frank Page, and Urban Couvillion, Jr., report that Jones will stay with the new setup.

RETMA MOVES HEADQUARTERS

The Radio-Electronics-Television Manufacturers' Assn. reports the relocation of its headquarters to the RETMA Building, 1721 De Sales St., N. W., Washington 6, D. C. They were formerly located at 777 14th St., N. W.

to Page 94 →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YOU CAN BUY IT NOW
with confidence
If you have not studied the time, space and money saving features that Printed Circuitry brings to products using electrical wiring, you owe it to yourself to do so. Just as you have depended upon Croname for over 50 years for the newest trends in fine decorative metal and glass parts, now also you can depend on Croname for the finest in Printed Circuitry production. Croname's leadership in the field is already a reality. Complete production facilities for one or two sided Etched circuits. Plated circuits with or without plated-thru holes produced to your specifications.
BUY AT CRONAME with confidence.

GENTLEMEN:
Please send me literature on PRINTED CIRCUITRY
NAME ..... FIRM .....
ADDRESS .....
CITY ..... STATE .....
WE ARE ☐ USING ☐ NOT USING ▪ PRINTED CIRCUITS ▪ PRESENTLY

INDUSTRY PERSONALS

The appointment of *Walter J. Roth*, recently associated with Beam Manufacturing Company, as administrative engineer for Whirlpool-Seeger Corporation's Marion Division, has been announced by G. J. Alaback, director of engineering.

Roth replaces *Oliver B. Hall*, who was promoted to works manager in December, and assumed his new duties on February 4. He will be responsible for the drafting, model shop, and standards sections, as well as general administration for departmental personnel, facilities, and financial activity.

Walter F. Hagman has been appointed director of engineering for the Norge Effingham, Ill., range and automatic clothes dryer plant. He will report to Jack Elmore, vice president and general manager.

Hagman was associated in research and development for 14 years with Globe American Corp., Kokomo, Ind., his last position being that of vice president. Before that he held design and engineering positions with Lockheed Aircraft Co., Burbank, Calif., and Bethlehem Steel Co., Morava, Calif.

ROTH

HAGMAN

Three men have been appointed to the position of "field merchandiser" in a new department of Norge home appliance field sales management.

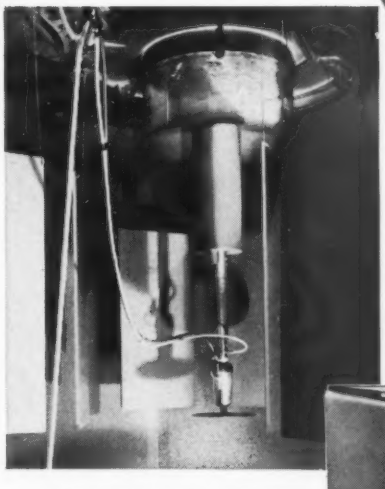
The appointees, and their headquarters, are: *John A. Curley*, Boston; *William C. Shader*, Chicago; and *John S. Wolfe*, Cleveland.

Dick O. Klein, national field sales manager for Norge Division, Borg-Warner Corporation, Chicago, explained that the main function and purpose of the new department is to supervise merchandising programs, and assist in distributor and dealer development.

Robert H. Mareneck has been named a leasing executive of the American Furniture Mart Corp., General Lawrence

to Page 93 →

NO REASON WHY YOU CAN'T DO IT, TOO!



Typical of the Mueller Climatrol line is this summer air conditioner and gas-fired winter air conditioner, now uniformly painted electrostatically with RANSBURG NO. 2 PROCESS

MUELLER CLIMATROL,

Milwaukee, increases paint mileage 40% with

RANSBURG NO. 2 PROCESS

And, 10 men averaging 40 hours a week now do the work formerly handled by 24 men averaging 50 hours!

Painting used to be a bottleneck in the manufacture of heating and air conditioning equipment at Mueller Climatrol.

But not any more!

When Mueller modernized its finishing department—replacing hand spray with Ransburg No. 2 Process Electro-Spray—daily production was increased . . . finishing costs were cut . . . and quality of the work was improved.

Annually, Mueller coats over 10 million square feet of sheet metal, so a 40% increase in paint mileage—translated into paint dollars saved—is a sizeable figure. Pointing up other savings, a typical run of 400 furnace casings used to take 200 man hours to clean and hand spray. Mueller does it now in 60 hours!

NO REASON WHY YOU CAN'T DO IT, TOO!

Whatever your product, if your production justifies conveyorized painting, chances are one of the Ransburg Electro-Coating Processes can do it better, for less, with improved uniformity and quality of the work. Write for our new brochure which includes numerous examples of both large and small manufacturers of a variety of products who are enjoying the many advantages of *Ransburg Electrostatic Spray Painting.*

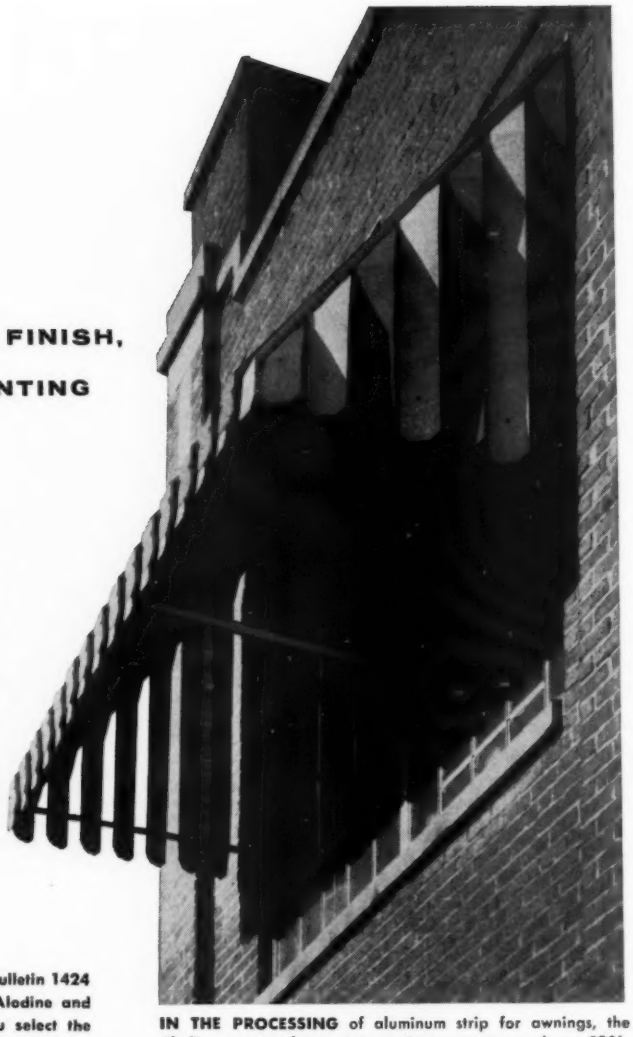
Ransburg **ELECTRO-COATING CORP.**

Indianapolis 7, Indiana

RANSBURG

ACP Alodine® ANCHORS THE FINISH, PERMITS FORMING AFTER PAINTING

Users of strip aluminum find that ACP Alodine anchors the finish so firmly to the metal that it can be roll formed after painting without damaging the finish. The chemical coating formed by this ACP product becomes an integral part of the metal, bars corrosion, adds years to the life of the metal.



LEARN MORE ABOUT ACP ALODINE. Bulletin 1424 describes the various types of ACP Alodine and gives information which will help you select the proper one for your particular application. Write for your copy today.

IN THE PROCESSING of aluminum strip for awnings, the Alodine process has cut operating costs as much as 33%, increased production as much as 50%.

COMMERCIAL AND MILITARY AIRCRAFT are treated with ACP Alodine to protect the metal and improve paint adhesion. Quality and economy are two important reasons.

MANY TRAFFIC ROAD MARKERS are treated with Alodine prior to applying the paint or reflective laminate. Alodine provides an excellent base for these materials.

A LARGE METAL TILE MANUFACTURER applies Alodine coating prior to putting porcelain on the aluminum—makes substantial process saving without sacrificing quality.

AMERICAN CHEMICAL PAINT COMPANY, Ambler 33, Pa.

CHEMICALS ACP PROCESSES

DETROIT, MICH. • ST. JOSEPH, MO. • NILES, CALIF. • WINDSOR, ONT.

New Chemical Horizons for Industry and Agriculture

Meet the men behind the gun!

Dan J. Buckle

DIRECTOR OF STYLING STUDIO

Saleability is born in the studio

The challenge of enhancing the saleability of a manufactured product through the originality and beauty of its finish, begins in our styling studio. Here, under the sensitive direction of Dan Buckle, work the men who are a rare combination of artist and technician.

Whatever the product, their job is to give it a special value through infinite combinations of color, clarity or embellishment that make it more desirable on the retail floor than a competitive product.

GRAND RAPIDS VARNISH CORPORATION

GRAND RAPIDS VARNISH CORPORATION, Grand Rapids, Michigan

GRAND RAPIDS VARNISH CORPORATION OF NORTH CAROLINA, High Point, N. C.

Makers of the Famous **Guardsman**® *Finish and* **Guardsman**® *Cleaning Polish.*

Studios in Grand Rapids, High Point, and Hickory

THE BETTER THE FINISH, THE BETTER THE BUY

...TO UNIFORM PRODUCTION

USE OHCO
"PERFORMANCE TESTED" FRITS

You can be sure of dependable performance . . . stability over a wide firing range . . . uniform production, minimum rejection . . . when you use O. Hommel frits. Each lot of frit produced by the O. Hommel Company is pilot-plant-tested under actual use conditions before being cleared for shipping. And this *performance testing* means *proven performance* for uniform, trouble-free production for you.

Why don't you try OHCO frits and see for yourself? Your O. Hommel representative will be glad to arrange a demonstration. Ask him, or write to . . .

"The World's Most Complete Ceramic Supplier"

Dept. MPM-457

THE O. HOMMEL CO.

PITTSBURGH 30, PA.

WEST COAST—[illegible] SIXTH STREET, LOS ANGELES

See you in the Hommel Hospitality Suite at the A.C.S. Convention, May 5 through May 9, Dallas

Industry Personals

→ *from Page 88*

H. Whiting, president, announced. Before joining the home furnishing marketing organization, Mareneck was for the last three years a Chicago sales executive on key accounts for the Philco Corp. Prior to that he served three years as vice-president in charge of sales for the United States Appliance Corp. in Menomonie, Wis.

Two new employees, *James L. Kirwan* and *Max Liggett*, recently began work in The Maytag Company's manufacturing division, Newton, Iowa.

Kirwan, 22, is a member of the company's recently-revised engineering and manufacturing training program.

Two new employes in the industrial engineering department of the company's plant 2 are *Clarke E. Boden* and *William A. Spellman*.

Boden has assumed duties as a work simplification analyst, and Spellman was hired as a work measurement analyst.

The appointment of *Lawrence W. Kelbley* as director of manufacturing for Datamatic Corporation has been announced by Walter W. Finke, president.

Kelbley comes to Datamatic from the Calidyne Company, Winchester, Mass., where he has been plant manager since 1951. The firm manufactures large electro-mechanical devices, and a variety of electronic equipment. Prior to association with Calidyne, he was with Curtis-Wright, Wright-Patterson Air Base, and Carrier Corporation.

Richard H. Kelly has been named Western field sales manager for Easy Laundry Appliances, Chicago, leading manufacturers of washers, dryers, and combination units. The appointment was announced by Parker H. Ericksen, vice president of the Murray Corp. of America and the Easy firm.

For the past three years, Kelly has been employed as Pacific regional and zone manager for the Crosley-Bendix Corp. Previous to that, he was district manager for Reinhard Bros. Co., Minneapolis, Minn.

Paul R. Newkirk has been named merchandise manager-appliances, American Kitchens division, AVCO Manufacturing Corp., according to an announcement by K. O. Dupree, director of sales.

Newkirk, formerly Magic Chef merchandise manager, will be in charge of development and sales of American Kitchens drop-in ranges, stack-on ovens, Roto-Tray and Roll-o-matic dishwasher-dryers, and disposers.

Fred L. Brewer has been named assistant to the director of purchases for the A. O. Smith Corporation, reporting to M. E. Morgan, director of purchases. Brewer joined the company's central purchasing organization in Milwaukee after serving as manager of purchasing, traffic, material and production control with A. O. Smith's Houston, Texas plant.

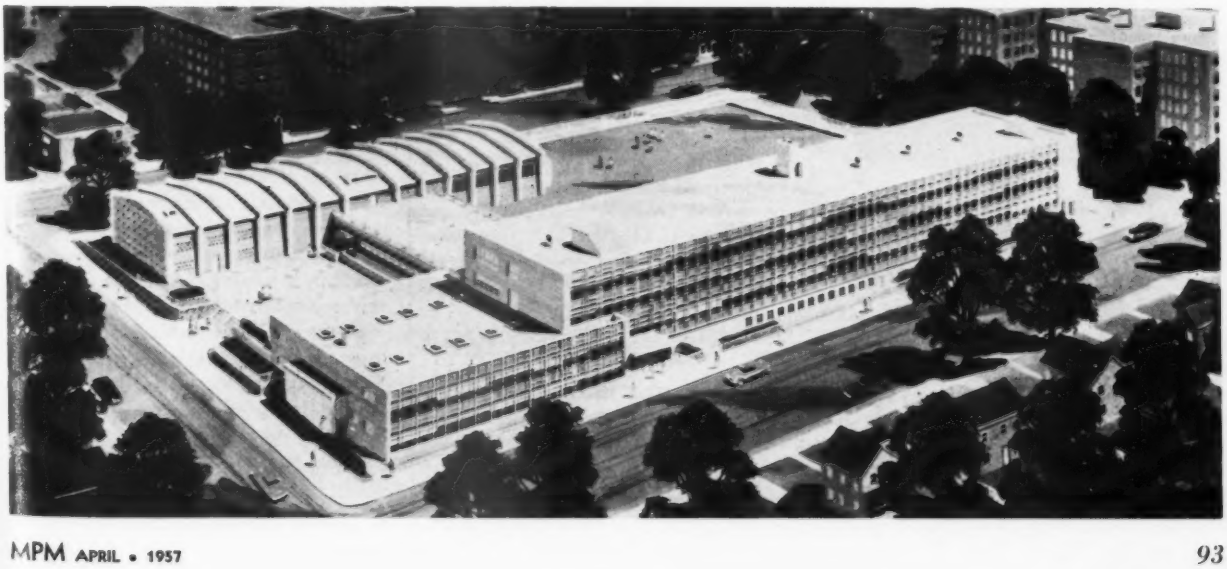
His duties will include cost and quality evaluation of purchased commodities, and coordination and exchange of purchasing research information with the corporation's 12 plants and subsidiaries.

Elbridge F. Rauscher has been appointed manager of mobile home air conditioning for Carrier Corp. He will have charge of sales, development, and manufacturing of equipment designed specifically for mobile homes, including the Carrier "Roomette." Formerly chief product engineer with Easy Washing Machine Corp., Rauscher succeeds James C. Patterson, recently retired.

Chester R. Davis, a senior vice president of the Chicago Title & Trust Co., was elected a director of Cribben & Sexton. He replaces Harry G. Zimmerman, a Chicago Title vice president. *R. J. Shepherd* was elected sales vice president. The firm manufactures appliances.

PUBLIC SCHOOL SHEATHED IN PORCELAIN ENAMELED PANELS

PUBLIC SCHOOL 189, Queens, N. Y., is being wrapped in 11,000 sq. ft. of mottled blue-green "sea porclad" laminated "sandwich" porcelain enameled curtain wall steel panels. The panels, measuring 3'7" by 6'9", are being installed in window wall frames. Seaporcel Metals, Inc., Long Island City, N. Y., produced the self-insulated sound deadening panels. Architect is Michael L. Radoslovich, chief architect, Board of Education, City of New York. T. C. K. Construction Co., New York, are the general contractors. According to M. Jesse Salton, Seaporcel president, the company has orders on hand for producing porcelain enameled curtain wall panels for sheathing 115 schools throughout the country.



INDUSTRY NEWS

→ *from Page 88*

MAYTAG REPORTS RECORD SALES

Annual net sales of The Maytag Co. have nearly doubled in the postwar decade, according to figures in a 10-year summary included as part of the appliance firm's annual report, mailed to shareholders recently.

The past year was termed "outstanding" by President Fred Maytag II in his letter to shareowners accompanying the financial report. Sales reached a record high of $113,015,022, a 21-per cent increase over the $93,067,185 recorded in 1955, the previous record.

"Improvement in net earnings was due largely to increased sales of home laundry equipment, and the economies that accrue from a high level of production," Maytag said. He credited favorable production levels, improvements in methods and facilities, and effective cost control programs with helping to combat the constantly-increasing pressures of rising labor and material costs, which he predicts will continue in the coming year.

for decorative
and functional
printing or coating

by Screen Process

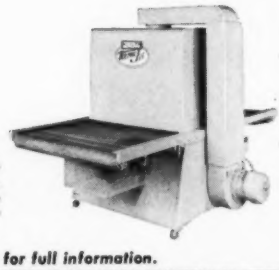
GENERAL DECORATOR PRESSES

Here is a press that has the versatility to handle a multitude of printing or coating problems on a productive basis.

Decoratively, it will print intricate designs and patterns, in one or more colors, with speed, precision and efficiency. Heavy deposits of metallic, or flourescent inks thus become practical with a General Decorator.

Functionally, it can apply the necessary deposits to certain integral parts which may be a part of the machine's operating mechanism. For example, the depositing of plating and acid resists in the manufacture of printed circuits and other etched products. Also, it can apply special coatings of adhesives, lacquers, and remoistening glue, overall or in restricted areas, at a productive rate that will speed manufacturing operations.

The possibilities for utilizing a General Decorator Press are almost limitless...and worth your complete investigation.



General Thermo Jet Dryers will reduce to seconds the drying time on many inks, coatings, resists, and adhesives which are applied by silk screen, roller coating or spray methods.

Write for full information.

GENERAL RESEARCH AND SUPPLY COMPANY
572 S. Division Ave. • Grand Rapids 3, Michigan

KELVINATOR BIDS FOR FOREIGN BUSINESS SUPREMACY

Formation of Kelvinator International Corp. a new wholly-owned subsidiary of American Motors, to coordinate expanding Kelvinator world-wide appliance operations, was announced March 1 by President George Romney.

"Creation of Kelvinator International represents a strong positive bid for a larger share of export markets for Kelvinator, which already ranks No. 2 among world major appliances manufacturers," Romney said.

The new company, incorporated under the laws of Delaware, will market appliance products made in the United States and abroad, and will concentrate on expansion of assembly operation in other countries.

Kelvinator has been a leading appliance manufacturer in Canada since 1926. Kelvinator of Canada, Ltd., with plants in Toronto and London, Ontario, has produced a wide variety of household appliances and commercial products.

In addition, Kelvinator products are built in 11 foreign countries: Argentina, Australia, Brazil, Colombia, France, Germany, Mexico, New Zealand, Norway, South Africa, and India.

ANNOUNCE FURTHER PLANS FOR APRIL RALLIES FOR MAY

A blueprint for April Rallies for May was drawn up at a meeting of the All-Industry April 10 committee on February 20 in the Hilton hotel, Chicago, chairmanned by William E. Kramer.

Simultaneous rallies on April 10 in the more than 140 cities where local industry committees exist are expected to provide the needed stimulus to get Plumbing - Heating - Cooling Month in May off to a flying start with participating manufacturers, wholesalers, contractors, and labor.

The meetings will be opened with a 12½-minute sound film strip, explaining the organization and purpose of a local industry committee to promote plumbing and heating modernization.

Next, an outstanding local speaker — perhaps a banker, a real estate man, or a representative of the FHA — will outline the potential in home and community remodeling work for plumbing and heating contractors.

Finally, there will be a success story, presented by a local contractor who has boosted his sales and profits substantially by concentrating on the growing home modernization market.

TURK AWARDS ANNOUNCED AT PEMCO OLD TIMERS DINNER

Four winners of the newly-established Heinrich and Karl Turk merit awards were announced at the thirtieth annual Pemco Corp. Old Timers' Dinner held in Baltimore recently. The awards, to be presented annually to employees doing the outstanding jobs during the year, were in the form of U. S. Savings Bonds totaling $2,500, along with attractive individual certificates. Top award of a $1,000 Bond went to Paul C. Stufft, senior research scientist. Three $500 Bonds went to Mrs. Ruth Sander, sales office manager; Phillip J. Dietz, traffic manager, and William Hoover, glass color worker.

Twenty-three other employees received Service Awards at the dinner in the Southern hotel main ballroom, among them Franz Nowak, laboratory engineer with forty years of service, and Herbert Turk, executive vice president, who received his Thirty-fifth Year Award. An interesting fact was the announcement that thirty-eight per cent of Pemco Corporation's employees have been with the company ten years or more, the minimum service for membership in the company's old timers' group.

Just under a century of service is represented in the time these three Old Timers' Society members have been with Pemco Corp., Baltimore. W. Russell Greer (center), vice president with 37 years of service, presented Thirtieth Year Awards to Anthony J. Lubertine (left), plant superintendent, and Albert Kollner (right), vice president in charge of export. One hundred persons attended the dinner.

DUPONT TO OPEN NEW PLAZA CENTER

One of the top 10 industries in the United States, comprising companies producing building products, this year will have a new $11-million showcase to display approximately 10,000 different items manufactured by its component companies.

The Dupont Plaza Center, situated in the heart of downtown Miami, Fla., will open the doors of its first unit, the International Architects Bureau of Building Products before next winter.

The first three tenants to contract for major display space in the new facility are Reynolds Metals of Louisville, Ky. and Richmond, Va.; Mosaic Tile Company of Zanesville, Ohio, and Universal-Rundell of Newcastle, Pa. Scores of other concerns are now in process of working out final details on exhibit space they will utilize for their various building products.

Actually, the Dupont Plaza Center is the country's first integrated, triple-purpose structure, combining under one roof a building products display unit of 100,000 square feet, a 70,000 square foot office unit, and a luxurious 301-room hotel.

BRANSON INSTRUMENTS EXPANDS INTO NEW PLANT FACILITIES

Branson Instruments, Inc., and its subsidiary, Branson Ultrasonic Corporation, recently moved into a new plant at 37 Brown House Road, Stamford, Conn., with more than twice the space available in its former plants.

Branson builds ultrasonic testing instruments, and a complete line of ultrasonic power devices, used in industries where fast and thorough cleaning of parts is vital to the production process.

ARMCO STEEL CORPORATION EXPANDS FACILITIES

Armco Steel Corporation will spend $50 million to expand its Ashland, Kentucky and Houston, Texas plants, R. L. Gray, Armco president, has announced.

According to Gray, the main items to be constructed at Ashland, Kentucky, are: a new blast furnace with capacity of 50,000 tons of pig iron per month; steel melting facilities with an annual capacity of 750,000 tons of ingots; and additional soaking pits and new finishing facilities.

At the Houston plant, a new heating furnace and other additions will be made to the 4-hi plate mill located there.

Construction of these facilities will begin as soon as the engineering work has been completed, Gray said.

The addition of 750,000 tons will bring Armco's total ingot capacity to nearly 7 million tons by mid-1959, he reported.

GE's METALLURGICAL DEPT. NOW MAGNETIC MATERIALS SECTION

In a decentralization move, the Edmore, Mich., plant of General Electric's metallurgical products department now becomes the magnetic materials section of the department, K. R. Beardslee, department general manager, revealed recently in Detroit.

General manager of the newly-formed section, he said, is E. E. George, formerly plant manager.

The new section will have full responsibility for the manufacture and marketing of permanent magnets and specialty resistors, Beardslee stated.

WYANDOTTE CHEMICALS TECHNICAL SERVICE EXPANDS

Wyandotte Chemical's J. B. Ford Division Technical Service Department has recently expanded its activities. Additional laboratory space has been assigned to the department both in Wyandotte, Mich., and Los Nietos, Calif. Additional personnel has been added to give field and laboratory service.

The experience of this group, plus files that cover over 40 years of every application of commercial washing, cleaning and germicidal operations, is available everywhere to North American industry.

Shown l. to r., (Back Row:)—Charles A. Wyatt, Leo J. Hawk, Thomas A. Gilman, Howard L. Anderson, Victor P. Boka, Richard H. Andrew, Armin A. Roth, Eugene G. Nutting, William F. Hawk, and Gail A. Smith, (Front Row:) Lee H. Minor, Rosalie Giaimo, Vera C. Heins, Donald E. Anderson, Beatrice M. Rike, Beverly J. Compeau, Robert J. Mooney, and Fred A. Vassar.

NEW REYNOLDS METALS PLANT

Reynolds Metals Co. plans a $1 million plant in Torrance, Calif. The plant will produce primary aluminum products and will employ 1000 persons. Operation is to begin late this summer.

HIGH-PRICED CREW PROCESSES FIRST INGOT AT NEW MILL

One of the highest-priced crews ever assembled for mill operation rolled the first ingot at the new $14-million slabbing and blooming mill of the Sharon Steel Corporation during its formal opening February 8.

A crew that included representatives of the eight firms that built the mill controlled each phase of the plant's start-up. The novel idea was originated by Al Tredwell, Jr., vice president of operations at Sharon Steel.

The mill is represented as the first in the steel industry to be entirely simulated on an electronic computer to construction.

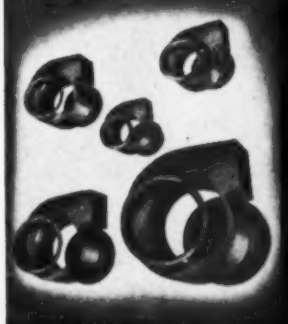
BINKS OPENS ATLANTA BRANCH

Burke B. Roche, president, Binks Manufacturing Company, industrial spray painting equipment manufacturer, has announced the opening of the company's new Atlanta, Georgia branch office, warehouse, and service center.

Located at 196 14th Street, Northwest, this is reported as the latest addition to a chain of Binks sales offices and parts inventory and repair facilities in leading U. S. cities.

C. E. Fuller, formerly sales promo-

want 10 or 10,000
BLOWER HOUSINGS
DE·STA·CO now?

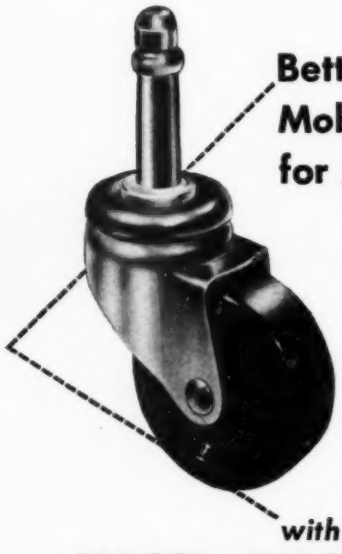


- available from stock
- high-level performance
- dimensionally uniform
- extremely adaptable
- fine quality
- wide size range

for wheels from 3¼" to 9½" dia.

Write for Complete DE·STA·CO Blower-Housing Brochure

DE·STA·CO
DETROIT STAMPING COMPANY
404 MIDLAND AVE., DETROIT 3, MICHIGAN



Better Mobility for Appliances with
NAGEL-CHASE CASTERS

Whatever your appliance, if it is supposed to move, you should consult Nagel-Chase. They have made millions of appliance casters, in fact it is their specialty, and are thoroughly familiar with what is required to provide dependable, long lasting, trouble free mobility for your appliance.

Write for catalog today.

The NAGEL-CHASE MANUFACTURING CO.
2823 North Ashland Ave. • Chicago 13, Illinois
Manufacturers of Nagel-Chase Casters and V-Belt Pulleys

Better Porcelain Enameling Starts Here

The "art" of porcelain enameling has become a modern, continuous-flow production process, making possible better and better products at ever lower relative costs.

In many new facilities for porcelain enameling, *automation* devices save time and money while electronic controls assure the highest standard of quality and uniformity in the finished products.

Designed and built by Ferro, these "model" porcelain enameling plants started with miniature models such as you see below. Into them has gone the know-how and experience of 35 years of industry leadership, during which time Ferro has built nearly 90% of all modern porcelain enameling facilities.

There is no question but that porcelain enamel is coming into ever wider and more extensive use. Naturally, the most efficient facilities will be the most profitable. Can we help *you* get a bigger, more profitable share of this rapidly expanding business?

FERRO

FERRO CORPORATION

Engineering Division

4150 EAST 56th STREET • CLEVELAND 5, OHIO

tion manager in the Binks Chicago home office, has been named manager of the Atlanta branch. He was formerly associated with the McEwen Cherry Company, Binks jobber sales representatives in the southeastern states, prior to joining the Binks organization.

The branch will service the entire Southeastern territory consisting of Georgia, North and South Carolina, Virginia, Florida, Alabama, Tennessee, Mississippi, Southern Kentucky, and Southern West Virginia.

CULLIGAN PRODUCES MILLIONTH WATER SOFTENER

A company which started a little over 20 years ago with $50 capital, and a lot of faith in an idea, passed a landmark recently.

Culligan, Inc., rolled its one-millionth water softener off the production line at its Northbrook, Ill., plant — and in keeping with the occasion—it was gold-plated and ceremoniously received.

The company is a large manufacturer in its field, and was a pioneer in the water softener business. Today, it has more than 1,100 independent franchised dealers who provide soft water and other water conditioning services in over 4,500 communities throughout the U.S. and Canada. Annual sales are at the rate of $7,000,000, and last year the entire organization, including dealers, grossed $65,000,000.

The company's present facilities include a manufacturing plant, laboratories, and main offices in Northbrook, Ill., a suburb of Chicago, and the world's largest zeolite (water softening mineral) producing plant in San Bernardino, Calif.

Shown with the gold-plated unit are Harold F. Werhane (left), president, Donald L. Porth (right), vice president, and Samuel R. Marotta, treasurer.

PENNSALT CHEMICALS STEPS UP CUSTOMER SERVICE PROGRAM

"More and better service for customers," was the theme of the Pennsalt Chemicals Metal Processing Products recent sales meeting at Seaview Country Club, Absecon, N. J. Fifty members of the company's field sales staff from all areas of the U. S. and Canada assembled for the three-day conclave and witnessed a complete review of modern service methods as they apply to Pennsalt metal processing products. Genuine service was described as the acceptance of responsibility for solving a customer's cleaning problems.

Sales Manager John M. Davidson, assisted by Chemical Specialties Director of Sales J. Stanley Hall and Product Manager Horace F. McIntyre, directed a series of panel discussions and sales clinics revolving around the company's nationally known line of metal cleaners, phosphate coatings, and cold working lubricants for the metal fabricating and finishing industries. Speakers included William M. Lee, manager of sales-service at the company's Whitemarsh Research and Development laboratories, and Jack C. Lum, manager of new products, who conducted a case history session describing new products in action. Of special interest was the new detergent iron phosphate Fosbond 25 which, he said, has found unusually rapid acceptance because of its unique coating quality and operating efficiency.

Pennsalt President William P. Drake addressed the men on the company's current expansion program and its recent acquisition of Delco Chemicals Co., whose manufacturing facilities in Los Angeles and Dallas will serve growing markets in the Southwest.

WHEELING COMPANY OPENS COLUMBUS, O. WAREHOUSE

A new warehouse to serve customers in parts of Indiana, Kentucky and Ohio, was recently opened according to E. B. Carter, vice president, Wheeling Corrugating Company. "This new location at 1785 Kenny Road, Columbus, Ohio," stated Mr. Carter, "will facilitate more efficient operations and result in improved service for our customers."

G. M. Long is manager of the Columbus branch and J. A. McQuilkin is assistant to the manager. Wheeling Corrugating Company is the sales subsidary of Wheeling Steel Corporation.

LINK-BELT MOVES LOUISVILLE DISTRICT OFFICE

Link-Belt Company moved its Louisville district office from 136 South Fourth Street to larger quarters at 235 East Burnett Street, effective February 22, according to Emmart LaCrosse, Jr., district manager. The Louisville Link-Belt office serves all of Central Kentucky from the Ohio River to Tennessee and four southern Indiana counties near Louisville.

TESTING MACHINES, INC., EXPANDS FACILITIES

Testing Machines, Inc., has announced the acquisition of the testing machine division of the National Forge and Ordnance Co. "This particular move rounds out our line of compression testers for flat, ring, and Concora Liner Test as well as larger testers for 5,000 and 10,000 pound compression of full containers," stated W. F. Bachelder, president of the firm. "The move is part of a scheduled program to round out our line of testing equipment." The company manufactures a line of impact testers and extensometers.

SORENG STANDARD
SNAPAC SWITCHES

OFFER YOU ✓ RUGGEDNESS
✓ DEPENDABILITY
✓ HIGH CAPACITY
✓ ECONOMY

USED BY MAJOR MANUFACTURERS FOR OVER 4 YEARS

The Soreng SNAPAC line is designed to provide rugged, dependable switches for the broadest range of snap action switch applications . . . at a realistic cost. The features listed define the characteristics of long life inherent in SNAPAC Switches. For complete information, we suggest you consult with a Soreng engineer or write for technical literature.

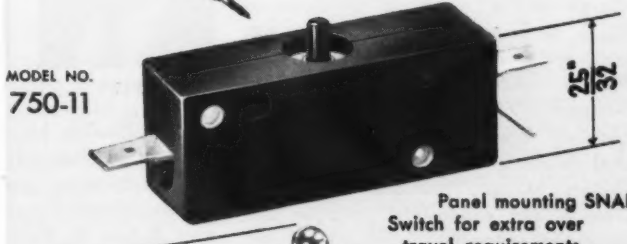
Electro-mechanical Features

- *Instantaneous, positive make and break action*
- *High contact pressure*
- *Non-sensitive to vibration and shock*
- *Stable under momentary high overload*
- *Available S P S T normally open or closed, or S P D T*

Rating:

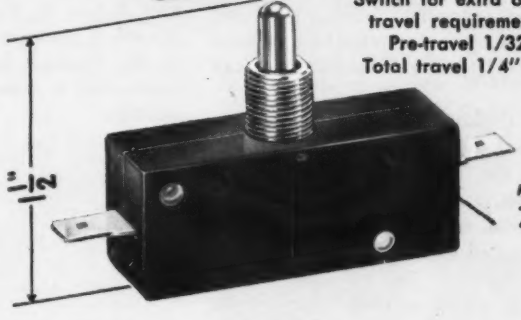
15 amp 125 V. A.C.
10 amp 250 V. A.C.
1/2 h.p. 125/250 V. A.C.
Listed by Underwriter's Laboratories

SNAPAC pin plunger switch operates within 1/32" to 1/16" pre-travel. Total 3/32" to 1/8".



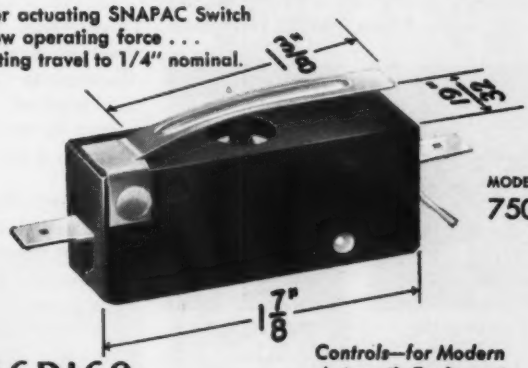
MODEL NO. 750-11

Panel mounting SNAPAC Switch for extra over travel requirements. Pre-travel 1/32" to 1/16". Total travel 1/4" to 3/8".



MODEL NO. 750-31

Lever actuating SNAPAC Switch for low operating force . . . operating travel to 1/4" nominal.



MODEL NO. 750-21

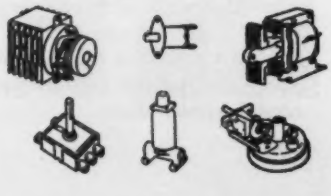
Write for SNAPAC Bulletin SL-3

CONTROLS COMPANY OF AMERICA

SORENG DIVISION

9559 SORENG AVENUE • SCHILLER PARK, ILLINOIS

Controls—for Modern Automatic Equipment



SUPPLIER PERSONALS

Appointment of *Dr. Kenneth W. Newman* to the position of chief process engineer has been announced by Turco Products, Inc., Los Angeles, manufacturer of specialized industrial chemical processing compounds. Newman has been with Turco for three and one-half years — first as a process engineer, and later as supervisor of the research division.

The Turco process division functions as a liaison between the sales and technical departments, and Newman's first undertaking, according to officials of the Los Angeles firm, will be to reorganize the process division to give maximum greater technical service in the field.

Revis L. Stephenson, vice president in charge of the industrial divisions of U. S. Hoffman Machinery Corp., has been appointed director of export and foreign operations, it has been announced. (*see general news section for company news*). The Hoffman industrial divisions of U. S. Hoffman Machinery Corp. produce centrifugal blowers and exhausters, portable and stationary vacuum cleaning systems, machine tool coolant clarifiers, solvent recovery systems, oil conditioners, and filters.

The Hoffman foreign operations, which are currently being expanded, include the manufacture of laundry equipment, vending machines, aircraft components, and pneumatic systems in plants located in Germany, Switzerland, France, Sweden, Austria, and Argentina, plus offices or distributors in 45 countries, as well as licensees in England, South Africa, Italy, and Spain.

NEWMAN

STEPHENSON

Acme Steel Company has announced a reorganization of its top management. *Fred M. Gillies* was elected chairman and chief executive officer, and *Guy T. Avery* was elected president and chief administration officer.

Carl J. Sharp, former chairman, continues as chairman of the executive committee. Avery, the new president, has been with Acme Steel 36 years, and has been executive vice president since 1953.

Acme also announced the appointment of *Bartlett Richards* as vice president and presidential assistant. Richards joined Acme Steel Company in 1933. In 1953, he was elected to the position of vice president of production, and became a member of the board of directors.

AVERY

RICHARDS

Fred Koelble has been named staff assistant for Pennsalt Chemicals' corrosion engineering products department. In this capacity he will assist sales manager Robert R. Pierce in the handling of orders, quotations, and specifications on the Pennsalt line of acid-proof cements used in bonding acid-proof brick and tile.

Pangborn Corporation, Hagerstown, Md., manufacturers of blast cleaning and dust control equipment, has announced the promotion of *Arthur J. Buckley* to general sales manager from his former position of sales manager.

R. H. Coin, president of Ingram-Richardson, Inc., Frankfurt, Ind., has announced the appointment of *Joseph Galeener* to the Ing-Rich Frit Sales and Service Staff. Galeener has been a technician in the Ing-Rich Research Laboratory for the past several years.

Rodney Metals, Inc., New Bedford, Mass., producers of rolled carbon and stainless steels, aluminum alloys, and prepainted steel and aluminum strip, announces the appointment of *Herbert G. Milner* as special sales representative. His headquarters will be at the New York office, 261 Fifth Avenue. Milner was formerly associated with Eastern Rolling Mills, Inc.

Changes in the national sales management of The Diversey Corporation have been announced by H. W. Kochs, chairman of the board.

Heading the list of executive changes is the appointment of *R. C. Perry* as the new general sales manager, succeeding *B. B. Button*, who was made vice president of sales on January 1. Perry, formerly Pacific division manager, has been with the company for 15 years.

Three new positions in Diversey's field management structure have been created by splitting the Eastern, Pacific, and Southern divisions. Eastern regional manager is *J. M. Sharp; J. K. Bradford, Jr.* is now Southern regional manager, and *J. R. McBrien* has been transferred to the Pacific Coast as Pacific regional manager.

Reber C. Stupp, general manager of Peters-Dalton, Inc., subsidiary of Detroit Harvester Company, announced the appointments of *Fred J. Burke* as factory manager, and *Robert G. Gallison* as chief engineer.

Formerly chief industrial engineer of Detroit Harvester Company, Burke also previously held supervisory positions in the Lincoln-Mercury and General Products Divisions of the Ford Motor Car Company, and performed industrial engineering services at the Glenn L. Martin Company, Baltimore, Md., and Johnson & Johnson, New Brunswick, N. J.

Gallison has been associated with Peters-Dalton, Inc., for the past twenty years. During that time he has held such positions as chief estimator, and most recently, Eastern regional sales-engineering supervisor.

Peters-Dalton, Inc., manufactures paint spray booths, drying and baking ovens, industrial washing equipment, dust collecting systems, and reusable metal containers.

BURKE

GALLISON

Four major promotions in Goodyear Tire & Rubber Company's Industrial Products division became effective February 1, according to *R. B. Warren*, who will step up to general manager of the division on the same date.

The chain-action reorganization followed the recent election of *Sam Du-*

Pree, the division's general manager, to vice president of the firm.

Appointed to new posts are *O. A. Schilling,* sales manager; *H. R. Comstock,* assistant sales manager; *R. E. Chapman,* manager, Central Region; and *R. E. Mercer,* manager of hose sales.

The division produces and sells thousands of rubber products for use by virtually every industry in the world. Chief products are all types of belting, hose, and molded and extruded rubber goods of rubber or plastics.

The appointment of *R. F. Rush* to sales manager, engineering division, Ferro Corp., Cleveland, O., was announced recently by E. W. Dany, vice president. Rush is a graduate engineer of Case Institute of Technology, and was formerly assistant sales manager of the W. W. Sly Co., Cleveland.

The promotion of *P. M. Wheeler* to sales manager was announced today by I. A. Dickey, vice president - sales, The Indiana Steel Products Company, Valparaiso, Indiana.

Formerly, Wheeler was assistant sales manager of the Valparaiso firm, large manufacturer of permanent magnets used primarily by the appliance, electronics, instruments, and communications industries.

Prior to joining Indiana Steel Products, he was a sales engineer for Chicago Vitreous Corporation of Cicero, Illinois.

Francis J. Paquin of Friendship, N. Y., has joined the porcelain enamel frit sales and service staff of The O. Hommel Company, according to a recent announcement by Ernest M. Hommel, president.

Appointment of *A. W. Roat* as applications engineer, controls sales section, of the Fulton Sylphon division of Robertshaw-Fulton Controls Company was announced today by George L. Ogdin, Jr., general sales manager.

Roat formerly served on the sales staff of the company's Fielden Instrument division. Prior to that he was in instrumentation sales with another controls manufacturer.

Hanson-Van Winkle-Munning Co. announced the appointment of *William A. Nairne* as manager of buff sales.

Nairne's headquarters will be located in Grand Rapids, Mich., at the company's midwest plant. There he will be associated with H-VW-M's buffing program and staff of finishing engineers in the continuing development of a complete line of buffs for the metal-finishing and allied industries, the company reports.

Benjamin Franklin Paint and Varnish Co., Philadelphia, Pa., announces the appointment of *Eugene G. Balassie* to the position of sales manager. Balassie previously held a staff position in the parent organization and more recently served as assistant sales manager at Illinois Paint Works, Chicago, an affiliated company.

United Wallpaper, Inc. announces the transfer and promotion of *John (Jack) R. Dove* from the home office in Chicago as sales co-ordinator to the Illinois Paint Works, also in Chicago, as assistant to the sales manager, A. W. Slocum.

Dove was employed in 1952 and held the position of sales co-ordinator from 1953 to date. He will administer the internal sales functions at Illinois Paint Works.

Walter F. Rockwell and *Woodford D. Miller* were elected to the board of directors of Robertshaw-Fulton Controls Company, it was announced by John A. Robertshaw, president. They will fill vacancies left by the resignations of Chauncey N. Mynderse and Clarence W. Robertshaw.

Rockwell was formerly chairman of the board of Acro Manufacturing Company, Columbus, Ohio. Robertshaw-Fulton recently acquired the Acro business. Miller is an executive vice-president of Robertshaw-Fulton Controls Company.

Daniel C. Boone and *Charles Wesley Rowles* have been named assistant controllers of Armco Steel Corporation, D. E. Reichelderfer, controller, announced.

Both men were appointed to their newly created positions by Armco's board of directors. Mr. Rowles will supervise the tax and tabulating departments. In addition to directing the clerical methods department as he has in the past, Mr. Boone will assist in the supervision of accounting programs at the company's various plants.

BOONE

ROWLES

Robert A. Laws, formerly assistant chief engineer, has been named manager of sales engineering of the Baker-Raulang Company, according to G. B. Davis, director of sales for the Cleveland manufacturer of industrial materials-handling trucks.

E. W. Ruhe has been appointed Roll-Bond manager of the Western Brass Mills Division, Olin Mathieson Chemical Corp., J. E. Williams, vice president and general manager of the division, announced recently.

LAWS

RUHE

RUSH

WHEELER

PAQUIN

ROAT

NAIRNE

BALASSIE

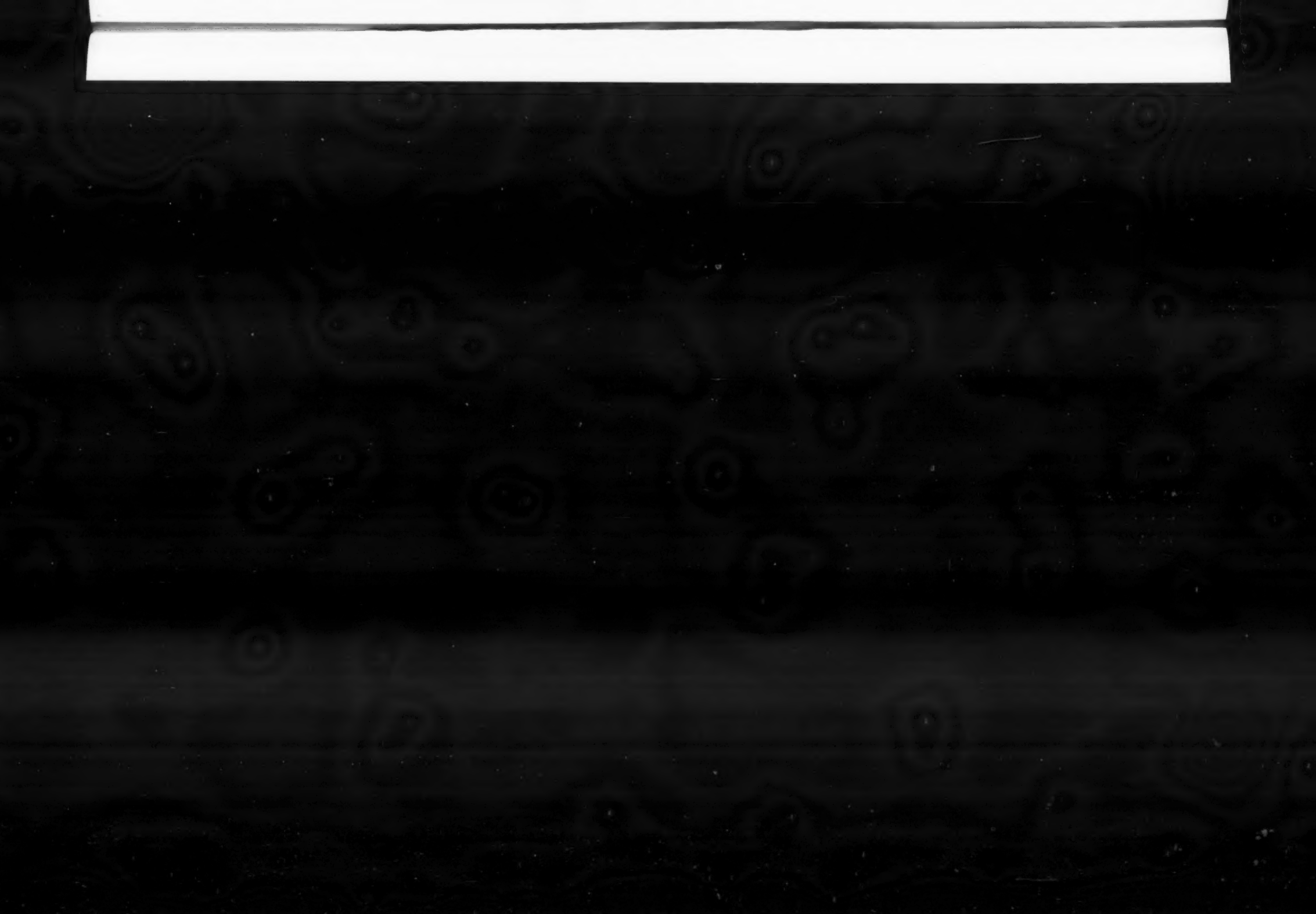
here's why Waste King® uses International shipping containers

- Economical—provides Safe Transit.
- Carton designed for fast, easy assembly. Cuts packing time 20%.
- Easy for retailer to grip and handle because of flange cap design.
- Tube and cap design also enables lift truck to stack without pallets—speedily and easily.
- Dishwasher arrives factory fresh because of dust-proof packaging.
- Large clean surfaces allow product identification and advertising.

Cap and tube design facilitate easy handling.

Lift truck inserts the lifting flange under one side of cap, pulls up. Strong construction enables sure, fast lifting, close stacking without usual jostling.

International Paper company
CONTAINER DIVISION
220 East 42nd Street, New York 17, N. Y.



CHECK THE FACTORS MOST VITAL TO YOU

Gaylord Boxes

Whether you're President, Vice-President, Treasurer, Purchasing Agent, Sales Manager, Production Manager, Traffic Manager, Advertising Manager...the above factors in selecting the right shipping containers deserve your personal attention.

Call your nearby Gaylord packaging engineer for boxes made to <u>your</u> prescription.

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES • KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION ★ ST. LOUIS

DIVISION OF CROWN ZELLERBACH CORPORATION

safe transit

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York Street at Park Avenue
Elmhurst, Illinois

editorial voice of the national safe transit program

devoted to improving packaging methods and shipping and materials handling methods for the appliance and metal products manufacturing industries. This section contains plant experience information and industry advances for the use of all executives and plant men interested in improving packaging and shipping methods and in loss prevention. The section contains complete information on the national safe transit pre-shipment testing program for packaged finished products and detailed reports of divisions and sub-committees of the National Safe Transit Committee.

A review of the laboratory program and how it helps the product manufacturer improve his product and package, reduce losses, and save money

Certified safe transit laboratories solidly back NST

by Paul T. Glaman • ASSISTANT SECRETARY, NATIONAL SAFE TRANSIT COMMITTEE

MPM FEATURE

A TOTAL OF fifty-eight testing laboratories are now certified under the National Safe Transit Program. Many others have indicated an interest in participation, and some of these are adding the equipment necessary to conduct Safe Transit tests.

Basic test equipment used by certified laboratories must be approved by the National Safe Transit Committee. Before a piece of test equipment is approved, it is submitted by the equipment manufacturer to the Committee's Technical Division for examination and study. Actual tests are conducted to determine its accuracy, performance ability, and practical value. It is then subjected to rigid and impartial tests by the independent U. S. Testing Company, Inc., in Hoboken, New Jersey. If the piece of equipment meets standards established by the Committee, it is officially approved and added to the NST Committee's List of Approved Test Equipment.

NST tests and the equipment necessary to conduct the tests are described in the Committee's booklet entitled, "Test Procedures." The equipment consists of a vibration tester, a drop tester, a Conbur testing device, and a shock recorder. A testing laboratory is certified under the NST Program on the basis of its possessing all this equipment and competent personnel qualified to operate the equipment, perform the tests, and interpret the results.

A representative in a Safe Transit laboratory puts a customer's packaged product through NST tests on the drop tester. The drop test, as described in NST's booklet, "Test Procedures," is used for packaged products weighing less than 100 pounds.

Certification procedure

The laboratory seeking certification completes an application form and designates its Safe Transit representative. Included is a complete list of the laboratory's test equipment with name, type, and model information. The application must also be accompanied by a strip of the laboratory's shock recorder tape showing the distance of travel required on the Conbur to obtain first quarter of fifth zone shock when the dolly is loaded with 100, 200, and 300 pound weights. This data is studied by the Committee's Technical Division. The Certification Committee then acts promptly. Once the laboratory has been officially certified, it is authorized to conduct Safe Transit tests for product manufacturers seeking NST certification.

Safe Transit Laboratories fall into four broad categories — Independent Testing Laboratories, Container Firm Testing Laboratories, Special Testing Laboratories, and Canadian Testing Laboratories. All of these laboratories have played an important and significant role in the growth of the National

Safe Transit movement and in the Program's goal of reducing in-transit damages to packaged products to an absolute minimum.

The thorough, painstaking work of these laboratories in following the NST test procedures has, in countless instances, provided a better container for the manufacturer's product. The manufacturer has confidence in the container. Because of the scientific approach embodied in these pre-shipment performance-type tests, he knows, prior to shipment, that his *product* is *designed* and *packaged* to withstand normal handling conditions and to insure its reaching its ultimate destination in perfect condition. In many instances, the manufacturer has been able to reduce his packaging costs as a result of this process.

Prior to the inception of the National Safe Transit test procedures, which simulate actual transit conditions, a great variety of methods were employed

Testing program

to test a packaged product's "shipability." Many laboratories and manufacturers were using sound, scientific procedures which simulated, or came close to simulating, transit conditions as they actually exist. An equally large number, however, were using tests which were based on guesswork. Some packaged products may have been rolled down a flight of stairs, and some rolled down two steps. Some may have been dropped from a two-story building, and some dropped only a few inches. These tests were too severe in some instances, and not sufficiently stringent in others. Industry, as a whole, had no common denominator from which to proceed.

It took many months and hundreds of test shipments over thousands of miles to develop the NST test procedures. These test shipments were conducted in cooperation with all modes of common carrier—the railroads, truck lines,

to Page ST-5

Conbur testing device in a Safe Transit laboratory. When this packaged product, manufactured by the O. A. Sutton Corporation, has met all Safe Transit requirements, O. A. Sutton will use the distinctive red and yellow Safe Transit label to proclaim to carriers and dealers that they have done their part to insure the safe delivery of their product. The Safe Transit Program made possible a $254,000 saving for O. A. Sutton during one 12-month period.

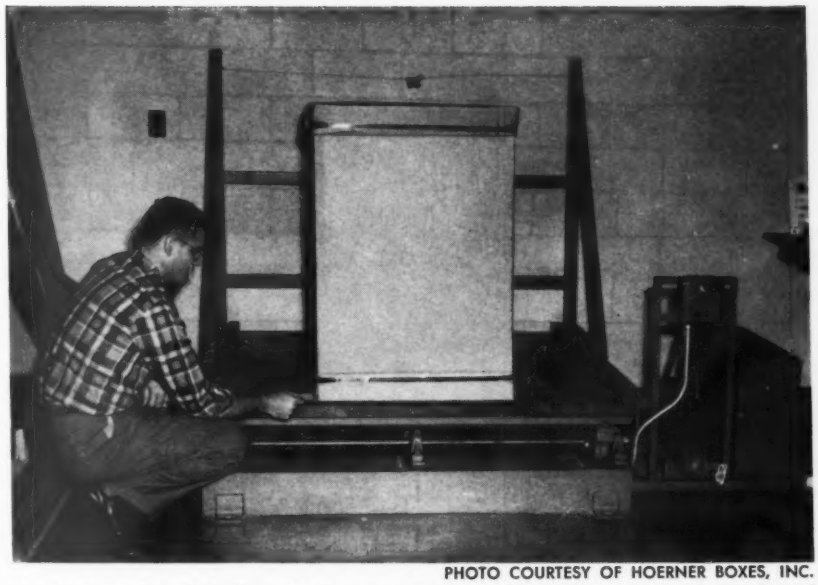

PHOTO COURTESY OF HOERNER BOXES, INC.

A technician in a Safe Transit laboratory makes a final adjustment to the packaged product on the vibration table prior to the unit's subjection to a vibration test.

The wide range of test equipment available from equipment manufacturers is illustrated in this photograph. Shown above is a vibration tester with a load capacity of up to 400 pounds. The vibration tester below has a load capacity of up to 10,000 pounds.

PHOTO COURTESY OF L.A.B. CORPORATION

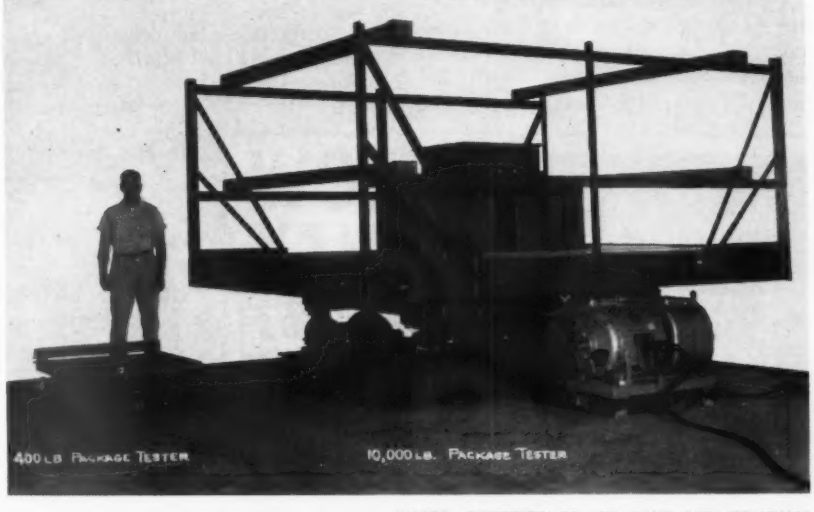

PHOTO COURTESY OF THE LOVE BOX COMPANY

Railway Express, and Air Cargo. Much correlation work and many man hours interpreting the results were also required. This data was checked and rechecked by the best brains in American industry — by more test shipments and ultimately corroborated by actual mass shipments by manufacturers — before the Committee's "Test Procedures" were finalized and formulated into simple, usable, workable form.

A much needed standard

These procedures have provided a much needed standard for American industry. All laboratories and manufacturers are now able to know the actual "norm" encountered by a packkaged product in transit, and they have a point from which to begin their testing and package analysis — a yardstick to use as a measure. Now that NST has supplied that "norm," laboratories and manufacturers can work together in developing a container, designed specifically for the product, which will insure the product's safe arrival.

The acceptance and effectiveness of the NST Program have long been attested to by product manufacturers who have realized substantial savings and increased overall profits by using the Program. The following reports from laboratories, however, further attest to the Program's worth, in the words of officials of representative certified laboratories.

Pleased with results

Sirs: We are very pleased with the results obtained through our many National Safe Transit Certified Laboratories. We have found that our designers are better able to develop efficient packages for our customers as a result of conducting the NST tests. We feel that our ability to run Certified NST tests has enabled us to offer a real service to our customers.

The National Safe Transit Committee should feel proud of the part they are playing in helping to reduce damage in transit.

Arthur B. Damon
General Manager
International Paper Company
New York, N. Y.

Helpful in analytical studies

Sirs: The pre-shipment testing of packaged products is beneficial and helpful in analytical studies generally involved in our package development work.

This type of testing (by exposing the completely packaged item) to conditions simulating the . . . forces normally encountered in transit, permits an overall comprehensive evaluation of the complete package and contents.

By subjecting the packaged product to conditions that disclose its true character, it follows that pre-shipment testing through cooperation in the NST Program provides a reasonable gage for reducing possibilities of error and otherwise predicting adequacy of the packaged product to withstand the rigors of shipping and to arrive at destination in satisfactory condition.

J. J. Koenig
Laboratory Manager
Gaylord Container Corporation
Division of Crown Zellerbach Corporation
St. Louis, Missouri

More economical Package

Sirs: We, at the Love Box Company, are very staunch supporters of the National Safe Transit Program . . .

Through the use of our certified laboratory we have been able to render shippers in this area a service by being able to assure them that their product would reach the consumer in good condition. In many instances, we have been able to recommend a more economical package or to suggest a slight change in their product to prevent damage of the . . . product without adding extra packaging materials.

. . . We firmly believe that this program has done more to prevent shipping damage than any other single method or program. . . .

We have hundreds of instances where our NST Laboratory has enabled us to assist our customers in the solution of a shipping problem that at first, looked to be near impossible and then, any solution appeared to be very expensive for the shipper. By designing and redesigning the packaging, and repeated testing, we have reached an economical solution in a very short time. It would have taken months to get the same results if we would have had to resort to actual trial shipping tests to get the results. We have in turn saved our customers and the carriers hundreds of dollars in damage claims and untold customer ill-will by having the solution to their shipping problems in such a short time.

Frank Grim
Packaging Design Engineer
Love Box Company, Inc.
Wichita, Kansas

Evaluating packaged products

Sirs: As Canada's second certified NST laboratory, we have carried out testing which complies with NST standards since March of 1956. . . .

From the point of view of a box manufacturer there are two advantages in being associated with the NST Committee. Firstly, of course, there is the benefit of having an outline for testing which gives . . . analogous situations to those found in actual transit, and which

to Page 112 →

BIGELOW GARVEY

WRAP-AROUNDS

FOR FASTER PACKING
SAFER SHIPPING
HANDLING and STACKING

OPEN and CLOSED

FEATURING B-G WRAP-AROUND CORNER

B-G Containers ideal for tall, heavy items such as — Water Heaters...Hot Air Furnaces...Refrigerators, etc.

B-G Containers are economical in cost — individually engineered...pre-tested...quickly assembled.

B-G sales engineer will gladly assist in your shipping problems. Please contact and take advantage of our 30 years experience.

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always check B-G — Write for complete details and prices to...
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General Office and Laboratory
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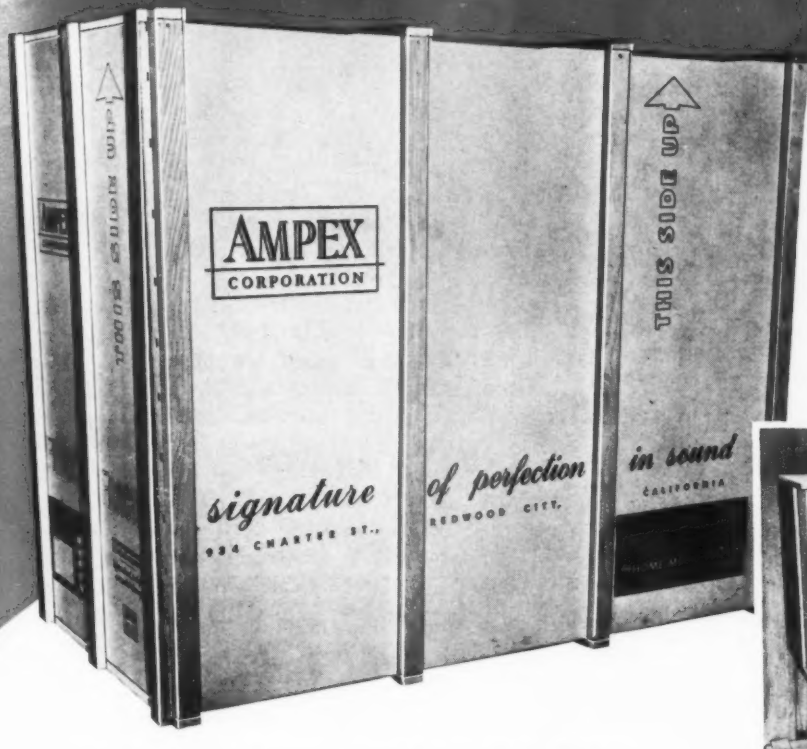
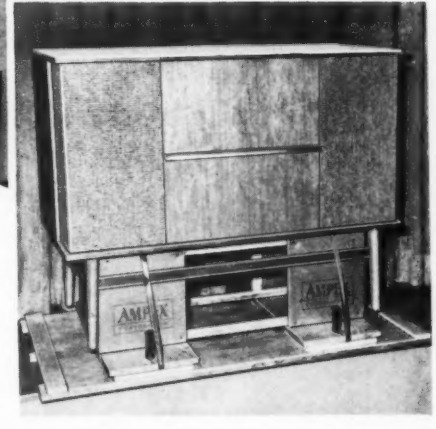
Phone WHitehall 4-5252

"All manufacturing, engineering and quality efforts are in vain if the product reaches its destination in a damaged condition."

Why AMPEX Stereophonic Sound is Shipped in WATKINS CONTAINERS





Here's the new Ampex Stereophonic Music System — $1470 worth of precision engineered sound equipment destined for the living rooms of music lovers all over the country. And it will arrive intact, thanks to the rugged strength of a custom-built Watkins container.

The Finest Products Go in Watkins Containers

They are preferred because of:

LOW COST • STACKING STRENGTH • 75% ASSEMBLED — UPON RECEIPT
EASE OF ASSEMBLY • EASY HANDLING • MINIMUM STORAGE SPACE
PROTECTION FROM DUST AND DIRT

Custom Protection . . .

THE WATKINS CONTAINER MANUFACTURERS

THESE COMPANIES BUILD WATKINS CONTAINERS

COZIER CONTAINER CORP.
446 East 131st Street, Cleveland, Ohio

CRATE-RITE MFG. CO.
1015 Orient Street, Oakland 7, California

DURA-CRATES, INC.
940 E. Michigan St., Indianapolis, Indiana

HEMB & MARTIN MFG. CO.
P. O. Box 108, Murfreesboro, Tennessee

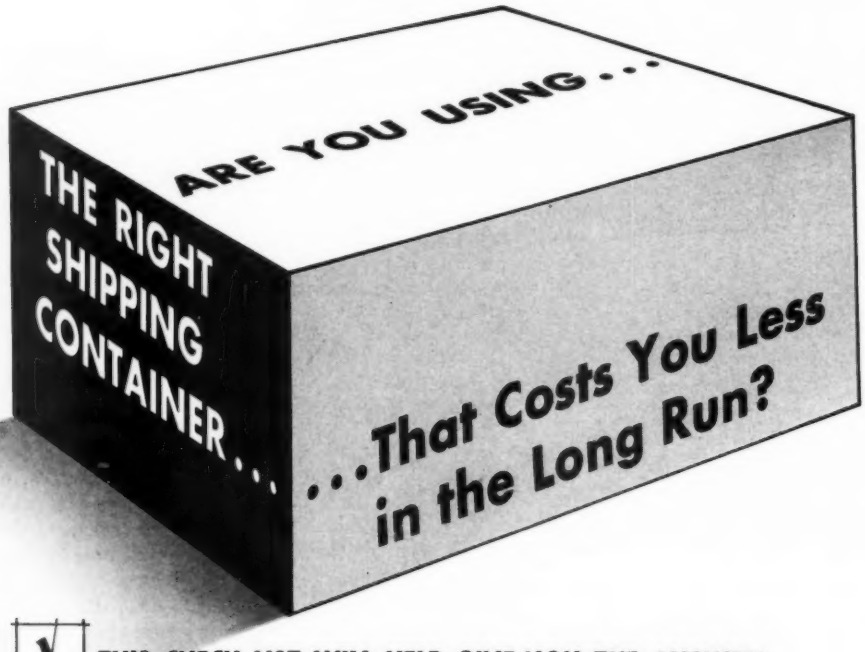
ILLINOIS BOX & CRATE CO.
811 Center Street, Plainfield, Illinois

KIECKHEFER BOX & LUMBER CO.
1711 W. Canal St., Milwaukee 3, Wisconsin

LEWISBURG CONTAINER CO.
243 Singer Street, Lewisburg, Ohio

LOVE MFG., INC.
P. O. Box 546, Wichita, Kansas

UTILITY CRATE CORPORATION
2019 Imperial St., Los Angeles 21, California



THIS CHECK LIST WILL HELP GIVE YOU THE ANSWER!

YES	NO	
☐	☐	I'M GETTING TOO MANY D.O.A. COMPLAINTS.
☐	☐	D.O.A.'s ARE SLOWING UP DELIVERY TO MY CUSTOMERS' CUSTOMERS.
☐	☐	I'M WASTING EXPENSIVE WAREHOUSE SPACE BECAUSE I CANNOT SAFELY STACK MY PRESENT CONTAINERS HIGH ENOUGH.
☐	☐	HIDDEN DAMAGE IS CAUSING TOO MANY DAMAGE CLAIMS.

If you answer "yes" to any of these questions . . . consult with a Chicago Mill representative on the right container for your product that will cost you less in the long run. Chicago Mill makes the most diversified line of containers in the country. Therefore we can recommend without bias, the best container for your product.

Only Chicago Mill *MAKES 'EM ALL!* The Most Diversified Line, utilizing Craveneer, Corrugated, Plywood, Veneer and Resawed Materials!

FREE! *Illustrated catalog describing Chicago Mill shipping containers and services.*

CHICAGO MILL AND LUMBER COMPANY

33 South Clark Street — Chicago 3, Illinois

PLANTS
- CHICAGO, ILLINOIS
- GREENVILLE, MISSISSIPPI
- HELENA, ARKANSAS
- ROCKMART, GEORGIA
- TALLULAH, LOUISIANA

SAFE TRANSIT NEWS

NATIONAL SAFE TRANSIT COMMITTEE

Associations Building, 1145 - 19th St., N. W., Washington 6, D. C.

New Company Certifications - Recent product manufacturers to be certified under the National Safe Transit Program are as follows:

Porter-Cable Machine Company, Syracuse, New York
(Power Machine Tools)
United Sound & Signal Company, Inc., Columbia, Pennsylvania
(Vending Machines)
Vendorlator Manufacturing Company, Fresno, California
(Bottle Beverage Vending Machines)
Davidson Corporation, Brooklyn, New York
(Printing Presses & Equipment)
Landers, Frary & Clark, Inc., New Britain, Connecticut
(Electrical Appliances)
Kent Plastics Corporation, Evansville, Indiana
(Decorative Plastics)
Allis-Chalmers Manufacturing Co., Boston Works, Hyde Park, Mass.
(Electric Circuit Breakers)
Glascock Manufacturing Company, Muncie, Indiana
(Vending Machines)

- - - - -

New Laboratory Certification - One testing laboratory was recently certified under the NST Program on the basis of possessing all the necessary equipment and trained personnel to conduct Safe Transit tests. This brings the total up to 57.

Bathurst Power & Paper Co., Ltd., Toronto, Ontario, Canada

- - - - -

Popular Safe Transit Educational Films - The NST Committee's two educational films--"The National Safe Transit Program," and "The National Safe Transit Story"--proved to be very popular in 1956 among manufacturing, container, carrier, university, and technical groups. Copies of the film were shown at a total of 49 meetings and programs. In some instances, both films were used.

So far in 1957, film programs have been presented at the International Harvester Company, Chicago; Burroughs Corporation, Detroit; Haskell Manufacturing Company, Pittsburgh; the Singer Manufacturing Company, New York; United States Gypsum Company, Genoa, Ohio; the Bakelite Company, Bound Brook, New Jersey; SIPMHE Chapter in Boston; the Fibre Box Association, Washington, D. C.; and the National Defense Transportation Association, Columbus, Ohio.

Requests for either NST film may be sent to the National Safe Transit Committee, Associations Building, 1145 Nineteenth Street, N. W., Washington 6, D. C. Please specify two alternate dates in addition to the date of your preferred showing.

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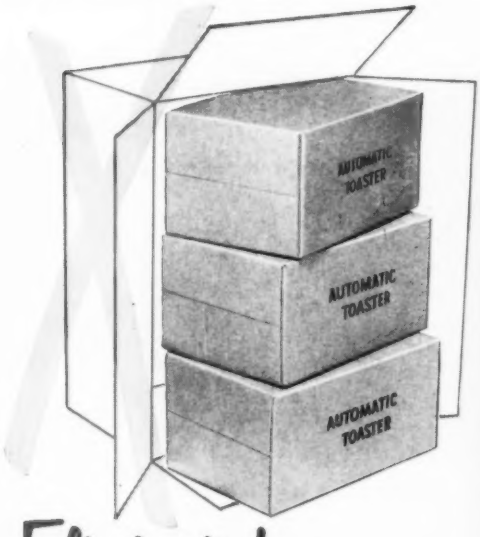
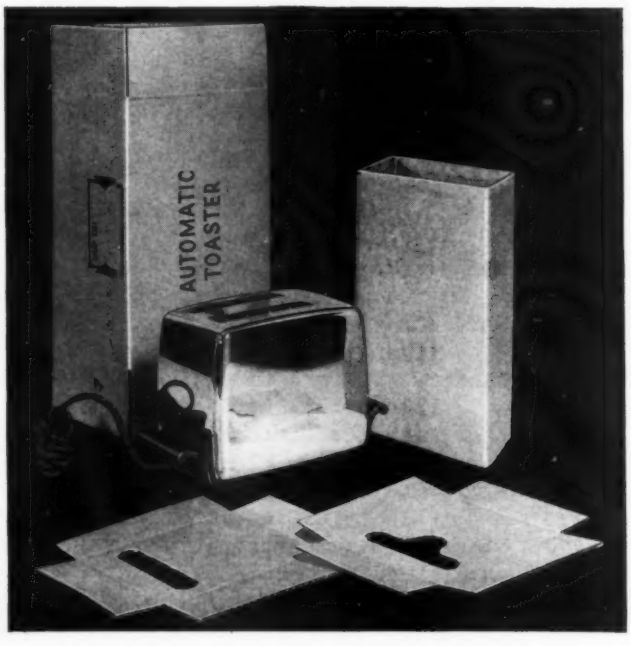
HOW *Inland* DESIGN LEADERSHIP SAVES YOU MONEY





Eliminated...

A MASTER CARTON AND AN ENTIRE PACKING OPERATION!

by *Inland* engineering and *Inland* material

● Think what it meant for this manufacturer, annually shipping more than a million leading brand-name toasters, to save the entire cost of a master shipping carton and the labor cost of packing it. Inland's engineering skill made it possible!

Now, an inner sleeve of Inland's exclusive Air-Pak material literally floats each unit inside its individual container . . . assuring safe delivery and eliminating the need for a master carton.

This single-unit packaging provides another advantage . . . distributors have greater flexibility in filling individual dealer orders.

Your Inland package engineer is a *corrugated shipping container specialist.* When your product packaging is entrusted to him, you can be sure you are getting the benefit of every possible packaging economy applicable to your product.

Inland Boxes Build Good Will

Send for this booklet fully illustrating Inland's services, facilities and products.

CALL YOUR INLAND PACKAGE ENGINEER

INLAND CONTAINER CORPORATION
INDIANAPOLIS 6, INDIANA

Corrugated Fiber Boxes

MILLS: Macon, Georgia; Rome, Georgia. **PLANTS AND SALES OFFICES:** Indianapolis, Indiana; Middletown, Ohio; Milwaukee, Wisconsin; Evansville, Indiana; Detroit, Michigan; Macon, Georgia; Erie, Pennsylvania; Ashtabula, Ohio; Orlando, Florida; Rome, Georgia; Biglerville, Pennsylvania.

Other Sales Offices in Principal Cities · Consult Your Telephone Directory

How Much Is

hidden damage

Costing You In Cash, Time, Trouble And Good Will?

You can't afford to play hide and seek with damage! Just imagine the total time loss resulting from delivery of a damaged product . . . the additional complications and costs and, most of all, the loss of your customer's good will. These are all very real factors in your total packing, handling and shipping costs . . . factors that can't be ignored on the balance sheet.

You can eliminate embarrassment and expense by packing your product in a tough, protective "see through" Wirebound Crate that allows fast, easy inspection at any time. Investigate Wirebounds for lower cost, safe packing, handling and shipping. Write for the informative booklet "What to Expect From Wirebounds," better yet, talk over your requirements with a Wirebound Sales Engineer. Write us for either the book or the man.

Write for the Book or the Man.

Wirebound
BOXES & CRATES

WIREBOUND BOX MANUFACTURERS ASSOCIATION
Room 1154, 327 South LaSalle Street, Chicago 4, Illinois

ADVERTISERS' INDEX

	PAGE
ALUMINUM CO. OF AMERICA	31 & 32
AMERICAN CHEMICAL PAINT CO.	90
AMERICAN NICKELOID CO.	14
ARMCO STEEL CORP.	1
BIGELOW-GARVEY LUMBER CO.	ST-5
C & H SUPPLY CO.	38
CHICAGO MILL & LUMBER CO.	ST-7
CHICAGO VITREOUS CORP.	77
CLEVELAND PROCESS CO.	23
COORS PORCELAIN CO.	6 & 7
CRONAME, INC.	88
CUYAHOGA SPRING CO.	23
DETROIT STAMPING CO.	96
DIVERSEY CORP., THE	15
DU PONT DE NEMOURS & CO., INC., E. I. ELECTROCHEMICALS DIV.	13
DU PONT DE NEMOURS & CO., INC., E. I. FINISHES DIV.	9
ELCO TOOL & SCREW CORP.	23
FASTEX DIV. ILLINOIS TOOL WORKS	2
FERRO CORP.	40 & 97
FLORENCE STOVE CO.	86
GAYLORD CONTAINER CORP. DIV. OF CROWN ZELLERBACH	ST-2
GENERAL INDUSTRIES CO., THE	10
GENERAL RESEARCH & SUPPLY CO.	94
GRAND RAPIDS VARNISH CORP.	91
HARRINGTON & KING PERFORATING CO.	5
O. HOMMEL CO., THE	92
HUYCK CONSTRUCTION CO.	87
ILLINOIS TOOL WORKS, FASTEX DIV.	2
INGRAM-RICHARDSON, INC.	73
INLAND CONTAINER CORP.	ST-9
INTERCHEMICAL CORP.	49
INTERNATIONAL NICKEL CO., INC.	79
INTERNATIONAL PAPER CO.	ST-1
MACCO PRODUCTS CO.	81
MAHON CO., THE R. C.	48
MARSCO MANUFACTURING CO.	4
McDANEL REFRACTORY PORCELAIN CO.	12
McLOUTH STEEL CORP.	11
MEYERCORD CO., THE	80
MILLS PRODUCTS, INC.	16 & 17
NAGLE-CHASE MFG. CO.	96
NATIONAL LOCK CO.	86
NEWCOMB-DETROIT	86
NU-MATIC GRINDERS, INC.	8
PEERLESS WIRE GOODS CO.	24
PEMCO CORP.	36
PENNSYLVANIA SALT MFG. CO.	84 & 85
PYRAMID MOULDINGS, INC.	71
RANSBURG ELECTRO-COATING CORP.	89
REPUBLIC STEEL CORP.	54 & 55
REYNOLDS METALS CO.	21 & 22
ROTOSPRAY MANUFACTURING CO.	38
SHARON STEEL CORP.	28
SHELL CHEMICAL CORP.	2nd COVER
SORENG DIV., CONTROLS CORP. OF AMERICA	99
TURCO PRODUCTS, INC.	57-62
TUTTLE ELECTRIC PRODUCTS, INC.	4th COVER
UNION STEEL PRODUCTS CO.	3rd COVER
UNITED WALLPAPER, INC.	75
VERSON ALLSTEEL PRESS CO.	82
VITRO MANUFACTURING CO.	44
WATKINS CONTAINER MANUFACTURERS' ASSN.	ST-6
WEAN EQUIPMENT CORP.	25
WIREBOUND BOX MANUFACTURERS' ASSN.	ST-10
WYANDOTTE CHEMICALS CORP.	20
YOUNGSTOWN SHEET & TUBE CO., THE	39

Customer Service YORK ST. AT PARK AVE., ELMHURST, ILLINOIS

"I saw your ad in MPM"

CLASSIFIED ADVERTISING

FOR SALE

For sale 37% equity Shepherd Chemical Company, Cincinnati, Ohio. Full information to legitimate inquiries to Box 4A, Dana Chase Publications, York St. at Park Ave., Elmhurst, Ill.

Certified safe transit laboratories

(Cont'd from P. ST-5)

are based on considerable test information. Secondly, . . . it gives the box manufacturer for the first time some way of explaining to our customers just what our testing accomplishes for them. . . .

As a container manufacturer we use the tests involved in NST to perform a service to our customers in evaluating their products, and particularly to evaluate our own containers, both corrugated and wirebound. We have found that the tests involved give valuable information, particularly on interior packaging and anchoring of products in our containers. . . .

Perhaps the most important principle in the operation of this laboratory is the design and pre-testing of packages before shipment, and our association with the National Safe Transit program is an extension of that principle to include a large, well-organized group, who have the same aims in a particular field of shipping.

We think highly of our association with the National Safe Transit program.

J. McK. Limerick, Research Director
R. H. McGee, Laboratory Supervisor
Bathurst Power & Paper Co., Ltd.
St. Laurent, Quebec, Canada

Sound cooperative relationships

Sirs: I want to take this opportunity to express our feeling for the service that the National Safe Transit organization is giving in promoting a sound relationship with all those concerned in making, packing, and shipping consumer products.

Actually, I think that the enthusiastic acceptance of the National Safe Transit Program speaks for itself. This acceptance implies, without reservation, the multitude of benefits received by all those who participate in this program, whether it be the Product Manufacturer, the Shipping Container Manufacturer or the Carrier who delivers the unit.

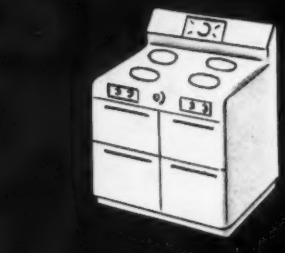
We are proud to be a part of the National Safe Transit Program and to advance its principles for a sound and enduring relationship with those we serve.

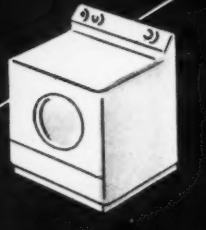
H. J. Schlotter
Director of Product Development and Engineering
Hoerner Boxes, Inc.
Keokuk, Iowa

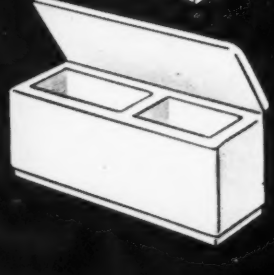
to meet the buying demand of today's market.....

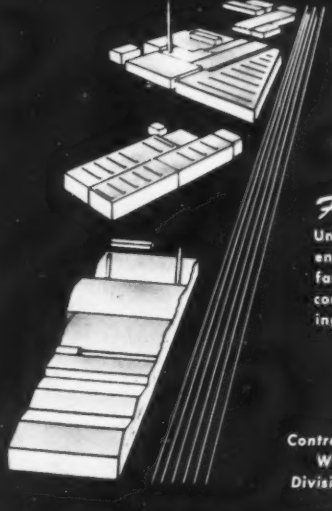
wire is vital

Men who know modern appliance design, engineering and construction, know that *wire is vital.* Why? Because wire components—welded in the desired shape and size, plated in the finish desired, are basically essential to the appeal, the sale and the continuous satisfaction of any appliance. Then, too, wire is the preferred material because of its styling, its strength, its lasting beauty and dependability. Whatever the appliance you manufacture, you can't afford to compromise quality for price and you can't afford to gamble on delivery. So—whether your appliance calls for range, refrigerator, dryer, dish washer, space heater, fan or room cooler or other components of welded wire, why not eliminate your problem by selecting the *one* manufacturer that has specialized in quality welded wire products for over half a century. Specify Union Steel Products Company . . . today. Both you and your customer will be glad you did!









Four Big Plants To Serve You Better!

Union Steel continues to expand their production, engineering, sales and service facilities to guarantee faster, more complete service to you. Four big plants, containing the most modern wire-forming and finishing facilities, are at your disposal.

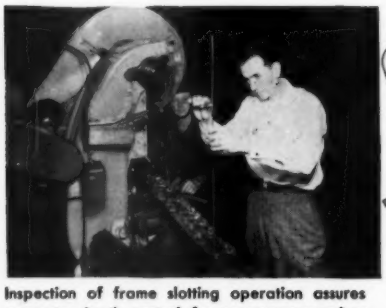
Contract Wire Division

UNION STEEL PRODUCTS CO.

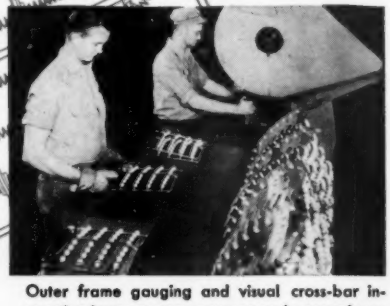
ALBION, MICHIGAN

HOW TEP QUALITY CONTROL PAYS OFF...

...PRODUCES BETTER OPEN-COIL HEATING ELEMENTS



Inspection of frame slotting operation assures accurate depth control for necessary crossbar "breathing space."



Outer frame gauging and visual cross-bar inspection insure proper squareness in accordance with specs.

Shape gauging inspection is another step in "TEP" quality-control procedure that saves installation time and trouble.

Wire-threading and inspection operations are combined in "TEP" assembly-line procedure.

Final ohm inspection before packaging insures correct wattage and wire size. Each unit is high potentialled at 1700 volts.

Exclusive Design Features Insure Long Service

- FLOATING FRAME CONSTRUCTION — "TEP" patented feature allows unit frame to breathe; flexibility lengthens frame life. Rigidly welded frames distort, or welds break.
- SURE-LOCK INSULATOR SUPPORTS — specially designed by "TEP" eliminate dislocating and subsequent electrical failures.
- SPECIALLY TREATED INSULATORS — reduce micro-amp leakage. "TEP" pioneered porosity-controlled steatite to assure longer life.
- SPECIAL NICKEL PLATING — exclusive "TEP" process assures a chrome-like finish, eliminates corrosion.

14-Point Assembly Line Inspection Saves You Time and Trouble

In the manufacture of "TEP" Open-Coil Heating Elements, progressive assembly line inspection has long been employed to assure a top quality product for appliance manufacturers. As illustrated, "TEP" quality control procedure employs 100% inspection of all units . . . is one of the major reasons why you save time and trouble in assembly and testing. There is a total of 14 inspection operations on the average "TEP-built" heating element. This method also insures maximum economy in manufacturing a quality product. For dependable performance, it pays to specify "TEP".

Design and Engineering Assistance

When developing new or improving old units, we suggest that you take advantage of free "TEP" engineering and design service. Over 30 years of experience in electrical heating applications is available to you. *Phone or write today* for specialized assistance with any of your heating problems.

TEP Products

TUTTLE ELECTRIC PRODUCTS, Inc.

formerly Ferro Electric Products, Inc.

KIRKLAND, ILLINOIS **PHONE: 37**

MANUFACTURERS OF OPEN COIL HEATING ELEMENTS, SWITCHES, SMALL DIE CASTINGS